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PROJECT APOLLO

NASA CONTRACT NAS 9-5191

TECHNICAL WORKING PAPER

APOLLO 12 PHOTOGRAPHY INDEX
70mm AND 16mm

22 DECEMBER 1969

PREPARED FOR
MAPPING SCIENCES LABORATORY
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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FOREWORD

This working paper presents the screening results of Apollo 12, 70mm and 16mm photography. Photographic frame descriptions, along with ground coverage footprints of the Apollo 12 Mission are included within, by Appendix.

This report was prepared by Lockheed Electronics Company, Houston Aerospace Systems Division, under Contract NAS 9-5191 in response to Job Order 62-094 Action Document 094.24-10, "Apollo 12 Screening Index", issued by the Mapping Sciences Laboratory, Manned Spacecraft Center, Houston, Texas.

Acknowledgement is made to those members of the Mapping Sciences Department, Image Analysis Section, who contributed to the results of this documentation. Messrs. H. Almond, G. Baron, F. Beatty, W. Daley, J. Disler, C. Dole, I. Duggan, D. Hixon, T. Johnson, A. Kryszewski, R. Pinter, F. Solomon, and S. Topiwalla. Acknowledgement is also made to R. Kassey and E. Mager of Raytheon Autometric Company

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SCREENING OF APOLLO 12 PHOTOGRAPHY

I. INTRODUCTION

The objective of this screening was to locate and plot the Apollo 12 photographs on a suitable base and obtain as much supporting information as possible to aid principal investigators in their detailed analyses.

The photographic phase of Apollo 12 was a success in that overall good quality photographs were returned. Good overlapping stereo strips and low and medium obliques of the lunar surface were obtained. Excellent photographs of the landing site area and of the Surveyor III spacecraft taken from the Lunar Module and from the surface were returned.

The cameras used in obtaining the photography of Apollo 12 were the 70mm Hasselblad Electric Camera with interchangeable 60, 80, 250 and 500mm focal length lens and the 16mm Data Acquisition Camera with interchangeable 5mm, 10mm, 15mm and 75mm focal length lens. The 16mm camera was also used in conjunction with the sextant. No photography has been received from the SO-158 experiment or from the lunar surface stereo camera at the date of compilation of this report.

II. PROCEDURES

The operational steps taken during the screening of the photography are explained briefly in the following paragraphs:

a) The Richards and K&E portable light tables were used in examining the 70mm transparencies.

b) The Athena stop motion 16mm projector was used in examining the 16mm transparencies.

c) The map used as the plotting base for all photographs was the Aeronautical Chart and Information Center, Lunar Planning Chart, 1:2,500,000 scale, 1st edition, July 1969.

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d) The following criteria were determined by the analysts in screening each photograph: (1) focal length of camera, (2) coordinates of the principal point of each frame, where applicable, (3) forward overlap of each frame, (4) approximate sun angle, (5) approximate tilt of camera, and (6) direction of tilt. In addition, a short description of the image content of each frame was added.

e) The finished plots were transferred from the Lunar Planning Chart to stable base clear film (registered to the lunar Planning Chart) and labeled as to the mission and magazine.

III. DISCUSSION

Each analyst was assigned a magazine of 70mm transparencies and furnished the necessary tools to complete his task. Two analysts were assigned the 16 mm transparencies to screen, describe and plot all lunar sequences.

The location of photographs in the area of the lunar farside between 115 and 135 degrees east longitude proved to be somewhat of a problem for two reasons: (1) The extremely low sun angle at the time Apollo 12 was in lunar orbit, and (2) the photographic coverage of the Lunar Orbiter Missions is poor in this region, making it very difficult to locate features imaged on the Apollo 12 photographs.

Another problem encountered in locating the photographs was in mare areas near the sub-solar point. In these areas, due to the extremely high sun angle, the lunar terrain features have very poor definition due to low contrast and shallow craters are almost impossible to identify.

Most of Magazine V and all of Magazines X, Y and Z were taken from the Lunar Module on the surface or from the surface at the Ocean of Storms landing site. Some of the frames were plotted; those frames which are part of a panorama were plotted on Orbiter III enlargements of the site. Many of the frames shot on the surface could not be plotted, however, due to lack of any identifiable plottable object such as the Lunar Module, large boulders, craters, etc. Photographic panorama mosaics were made of many of the areas from 8x10 inch prints.

IV. CONCLUSIONS

A total of 1573 frames of 70mm and 69,519 frames of 16mm film taken on Apollo 12 mission were screened. Very few problems were encountered in screening these photographs. The overall good quality of the individual frames made it possible to locate and plot most of the 70mm photographs.

A large number of frames were taken over areas of the lunar surface never before photographed during an Apollo lunar flight. Areas from the Sea of Nectar to the Sea of Rains, the Central Bay Area and, of course, vast areas of the Ocean of Storms were photographed. Included among these photographs were many geologically interesting craters adding greatly to the growing number of already photographed lunar features recorded on previous Apollo lunar missions. Good quality photography was also obtained of the Fra Mauro landing site, which is to be the target of the Apollo 13 lunar landing mission.

V. RECOMMENDATIONS

It is recommended that during future missions, photographs of areas in high sun angles (near the sub-solar point) and areas within the terminators be eliminated wherever possible. It is felt this film could be better employed in recording images of lunar features in areas where better lighting conditions exist.

MAGAZINE Q

Frames AS-12-50-7325 thru 7459

This color (368) magazine has pictures taken just after TLI and into Lunar orbit 3 with 3 focal length lenses: 80, 250, and 500mm. Earth, moon, spacecraft parts, and spacecraft interior are included.

In general the quality of the images are good although camera movement, and positioning of the camera axis near the sun caused about 9 frames to be nearly useless. Most Lunar topography and all earth frames are oblique (or contain the whole sphere); 5 frames of Petavius-B are near vertical; 13 frames (not numbered) were skipped and not exposed in groups of 1 and 2 frames.

Five useable frames document the smear and liquid droplet movement on the circular hatch window and the left (square) window of the CSM and were taken shortly after TLI. This liquid was apparently largely outside the innermost glass pane.

TO's covered (or partially covered) are: 3, 4, 5, 10a, 11, 12, 18, 23, 26, 27, 30, 32, 34, and 35.

High angle obliques (such as Eratosthenes and Humbolt frames) tend toward a more reddish brown color especially when the illumination on the image is a low to medium angle.

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Magazine Q Film 368

Time Reference — GET _____ = GMT _____

Frame # AS-12-10	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7325	80	1:15,000,000	32N	88W		Med	Good		S E	Yucatan, Lake Mich. Gulf of Mex. clouds
7326	80		space			Med	good	70°	NW	Earth, SLA near horizon So. Amer., Mexico COLOR NEG
7327	250						fair			LM, SIVB, Prob H_2O drops
7328	"						fair			"
7329	"						fair			"
7330	"									blank
7331	"						good			Earth, ½ illuminated, N&S America
7332	"						good			"
7333	"						good			"
7334	"						good			"
7335	"						good			S-IV-B
7336	"						good			"
7337	"						good			"
7338	"						good			½ Earth, S.Am
7339	"						good			½ Earth, S.Am

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Frame # AS-12-50	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7340	250						good			
7341	"						good			S-IV-B
7342	"						"			½Earth,S.Am
7343	"						"			,S-IV-B
7344	"						"			,S-IV-B
7345	"						"			S-IV-B,LMedge
7346	"						"			"
7347	"						"			"½Earth,S.Am
7348	"						"			"
7349	"						"			S-IV-B LM edge
7350	"						"			"
7351	"						"			½Earth,S.Am
7352	"						"			"
7353	"						"			"
7354	80						"			ocean 1/3 earth illuminated.

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7355	80						good			1/3 Earth illuminated, ocean
7356	80						"			"
7357	80						"			"
7358	500						"			1/3 Earth, Australia on horizon
7359	500						"			"
7360	500						"			"
7361	500						"			"
7362	250						"			"
7363	250						"			"
7364	250						"			"
7365	250						poor			1/3 Earth, Australia, brownish cast
7366	250						fair			1/4 Earth illuminated
7367	250						fair			1/4 Earth illuminated sunglint
7368	80						poor			fouled hatch window, streaks go away from CMS cone apex
7369	80						fair			fouled hatch window, streaks go away from CMS cone apex

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7370	80						fair			sq.left window fouled max.liquid is along edge away from cone apex
7371	80						fair			"
7372	80						good			left window;max liquid edge is away from cone apex
7373	80						poor			LM thrusters
7374	80						fair			Edge of LM
7375	80						poor			Window, Camera Movement
7376	80						poor			"
7377	80						fair			1/5 Earth,terminator
7378	80						fair			"
7379	80						"			"
7380	80						"			"
no number	250						very poor			3 under-exposed frames of no use; probably earth
7381	"						good			1/5 Earth terminator probably W.Australia
7382	"						"			"
7383	"						"			"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7384	250						good			1/5 Earth terminator probably W. Australia
7385	"						"			1/5 Earth, terminator
7386	"						"			"
7387	"						"			"
7388	"						"			"
7389	"						poor			pre-Rev. 1, moon darkside
7390	"						"			"
7391	"						fair			1/4 Earth illuminated
7392	"						"			"
7393	"						"			"
7394	"						"			"
7395	"						"			"
7396	80						poor			window edge, 1/4 Earth
7397	250						poor			window streak; shutter pentagon
7398	"						"			smear; shutter image

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7399	250						Poor			Smear; shutter image
7400	"						"			"
7401	"						"			"
7402	500		9N	7E		Low	Fair	50-65°	N	Triesnecker-Hyginus Area TO-21, 22; Rev. 1
7403	"		4N	11E		"	"	"	"	Triesnecker-Agrippe Center Crater, TO-21,22 Rev. 1
7404	"					Med.	"	60-75°	SE	Between long 140E & 160E:, Rev. 2
7405	250		IN	SPACE	80	"	Good	60-70°	N	Mare IX, about 140°E Rev. 2
7406	"		IN	SPACE	80	"	"	"	"	"
7407	"		IN	SPACE	"	"	"	"	"	Mare IX, about 140°E Rev. 2, red window edge
7408	"	1:4,000,000	4N	120E	60	"	"	50-60°	"	Crater 211 near horizon Rev.2; Partial TO-4
7409	"	"	5N	120.5E	"	"	"	"	"	"
7410	500	1:5,000,000	32S	108E		High	Good	65-75°	S	West of Mare III; Rev. 2
7411	"	"	32S	108E		"	"	"	"	"
7412	"	"	28S	84E	25	"	"	50-60°	SE	East edge of Humbolt; TO-10a; Rev. 2
7413	"	"	28.5S	81E		"	Fair	"	"	Humbolt, S Mare on Horizon. Rev.2.TO-10a

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7414	500	1: 5,000,000	29S	78E	25	High	Good	50-60°	S	West edge of Humbolt TO-10a; Rev. 2
7415	"	"	28S	80.5E	"	"	"	"	SE	Humbolt; Mare Australe on horizon; TO-10a Rev. 2
7416	"	"	"	"	"	"	"	"	"	"
7417	"	"	"	"	"	"	"		"	"
7418	"	"	"	"	"	"	"	"	"	"
7419	"	"	27.5S	76.5E	"	"	"	"	"	West edge of Humbolt; TO-10a; Rev. 2
7420	"	"	27.5S	"	"	"	"	"	"	"
7421	"	"	"	"	"	"	"	"	"	"
7422	"	1:4,600,000	16.5 S	41E	90	Med	"	7-15°	S	Bohenberger area; TO-12; Rev. 2
7423	"	"	"	"	"	"	"	"	"	"
7424	"	"	"	"	"	"	"	"	"	"
7425	250	"	14S	35E	30	"	"	10-15°	SW	Mare Nectaris; ≅GET 36:17, Rev. 2
7426	"	"	14.5S	33E	"	"	"	"	"	"
7427	"	1:1,380,000	10.5S	18E	90	"	Fair	15-24°	SE	Descartes-Kant Area; TO-18, Alt. 158N. Mi.
7428	"	"	8S	"	"		"	"	SE	GET≅36:22 "

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7429	250	1:1,380,00	8S	7.5E	90	med	good	5-10°	SE	Hipparchus, Albategnius TO-23; GET ≅ 86:23
7430	"	"	8S	7.5E	90	"	"	5-10°	SE	"
7431	"	1:1,350,000	4S	6.5E	95	"	"	20-25°	SE	Herschel in center; Rev 2 GET ≅ 86:24; TO 26, 27
7432	"	"	4S	6.5E	95	"	"	"	"	"
7433	500	1:2,000,000	15N	11.5W		low	fair	65-75°	N	Eratosthenes; Rev. 2 GET ≅ 84:30
7434	"	"	16N	4.5W		"	"	70-80°	NE	Apenninus Mts., Rev. 2 Bode Rill II; GET ≅ 86:26
7435	250	1:4,900,000	4S	7W		low	good	50-40°	NE	Lalande, Herschel & Ptolemaeus; TO-30,32; Rev. 2
7436	"	1:4,000,000	2.5S	14W	90	3-5°	fair	8-14°	E	Gambart in North TO-34,35 Rev. 2
7437	"	"	"	"	"	"	"	"	"	"
7438	"	"	"	"	"	"	"	"	"	Gambart in North; TO-34, 35, term. @ west edge Rev. 2
7439	"	"	"	"	"	"	"	"	"	"
7440	"		in	space		med	good	86°	N	Mare IX; limb Rev. 3
7441	"		"	"		"	"	"	"	"
7442	"	1:2,400,000	15S	130E	30	"	"	65-75°	SE	N. of Tsiolkovsky; partial coverage TO-3
7443	"	"	"	"	"	"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7444	250	1:2,400,000	17S	122.5E	80	med	good	55-60°	SE	about 90 N.M. NW of Tsiolkovsky TO-5
7445	"	"	"	123E	"	"	"	"	"	about 60 N.M. NW of Tsiolkovsky TO-5
7446	"	"				"	"		SW	long. 80E to 125E (?)
7447	"	"				"	"		"	"
7448	"	1:10,000,000	25S	84E		high	good	50-60°	S	Humbolt area
7449	"	"	24.5S	83E		"	"	"	S	"
7450	"	"	"	80.5E		"	"	"	"	"
7451	"	"	25S	80E		"	"	"	"	"
7452	"	"	"	77E		"	"	"	"	"
7453	"	"	"	73.5E		"	"	"	"	"
7454	"	"	"	"		"	"	"	"	"
7455	80	1:1,376,00	18S	61E	0	high	good	5-5°	S	East of Petavius B TO-11
7456	"	"	18.5S	59E	0	"	"	3-5°	S	Near Petavius B TO-11
7457	"	"	19S	58.5E	10	"	"	"	"	"
7458	"	"	19.5S	57E	10	"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7459	80	1:1,376,000	19.5S	56E	5	high	good	3-5°	S	Petavius B TO-11
no number										about 1/5 of a frame at end of roll.
							The number of blank frames, in groups of 1, & 2, is:			
										twelve (12)

MAGAZINE R

(Frames AS12-51-7560 thru Frames 7588)

Magazine R is 70mm color photography of the lunar surface, and some views of the earth. The photographs were taken from the Command Module at approximately sixty nautical miles orbital altitude. The majority of photographs were oblique with a view on track or in a northerly direction. A 80mm lens was used for all but twenty frames. The remaining frames were recorded with a 250mm lens. Photo quality was good with the exception of approximately ten percent of the magazine. Eighty percent of the frames cover areas of the lunar surface on the near side with ninety percent of these covering from 35° East longitude to 40° West longitude.

The following targets of opportunity were fully or partially imaged: TO #7, #8, #9, #15, #23, #25, #26, #27, #29, #31, #32, #33, #34, #35, #36, #37, #39, #40, #42, #43, #44, #45, and #47.

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7460	80	1,678,600	12°S	33°E	0	High	Good	30-40	N	Sea of Nectar, Crater Daguerre
7461	"	"	"	"	90%	"	"	"	"	"
7462	"	"	11.5°S	32.5°E	70%	"	"	"	"	"
7463	"	"	11°S	31°E	50%	"	"	"	"	Crater Madler
7464	"	"	"	30°E	70%	"	"	"	"	"
7465	"	"	10.5°S	29°E	60%	"	"	"	"	"
7466	"	"	"	28°E	80%	"	"	"	"	Craters Theophilus and Madler
7467	"	"	10°S	27°E	70%	"	"	"	"	Craters Theophilus & Theophilus B
7468	"	"	"	26.5°E	70%	"	"	"	"	Craters Theophilus & Theophilus B
7469	"	"	10.5°S	25.5°E	60%	"	"	"	"	"
7470	"	"	"	25°E	90%	"	"	"	"	"
7471	"	1,880,100	14°S	3°E	0	Med	"	40-45	SW	Craters Albategnius and Parrot
7472	250	622,200	9.5°S	0	0	"	"	40-50	S	Crater Ptolemaeus
7473	"	583,000	8.5°S	1°W	"	"	"	35-45	S	Crater Ptolemaeus A
7474	"	"	"	3°W	"	"		35-45	S	West side of Crater Ptolemaeus

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7475	250	622,200	8.5°S	4°W	50%	Med	Good	40-50	S	West Side of Crater Ptolemaeus
7476	"	969,200	14.5°S	7°W		"	"	60-70	S	Craters Lassell and Alpetragius B
7477	"	1,041,100	15°S	8.5°W		"	"	"	"	Craters Davy, Lassell, and Lassell C
7478	"	1,126,100	14.5°S	9°W		"	"	65-70	S	Craters Davy, Lassell and Lassell C
7479	"	"	14°S	9.5°W		"	"	60-70	"	Sea of Clouds, Crater Lassell C
7480	"	503,100	2.5°S	14°W	0	Low	Poor	25-35	W	Area North of Fra Mauro, very dark
7481	"	767,100	9°S	15°W		"	Fair	50-60	S	Craters Parry and Parry A
7482	"	"	8.5°S	15°W		"	"	"	S	"
7483	"	"	8°S	16°W		"	"	"	"	Craters Parry, Fra Mauro
7484	"	"	7.5°S	17°W		"	"	"	"	Very dark- SE Rim of Fra Mauro
7485	"	1,041,100	10.5°S	7°W	0	Med	Good	60-70	SW	Crater Davy, Davy ¢
7486						Low	Poor			Very Dark-Terminator Shot Not Plotted
7487						"	"			"
7488						"	"			"
7489							Good			Earth View

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7490	80				0	High	Poor			Sea of Fertility Not Plotted
7491	"				70	"	"			Sea of Fertility Not Plotted
7492	"				0	"	"			"
7493	"				70%	"	"			"
7494	"	1,411,200	15°S	4.9°E	0	"	Good	10-15	W	Sea of Fertility, Crater Colombo M
7495	"	1,454,200	"	"	95%	"	"	15-25	W	"
7496	"	1,517,100	"	48.5°E	90%	"	"	20-30	W	Craters Columbo M and McClure A
7497	"	1,572,100	"	48°E	90%	"	"	25-35	"	Craters Columbo M & East Rim of Colombo
7498	"	1,678,600	12°S	19.5°E	0	"	"	30-40	"	Craters Kant, Cyrillus, B and Kant D
7499	"	"	"	"	95%	"	"	"	"	Craters Kant, Kant D, and Cyrillus B
7500	"	"	"	"	"	"	"	"	"	"
7501	"	2,184,900	9°S	5.5°E	0	Med	"	50-55	"	Craters Hind, Halley Albategnius and Muller
7502	"	"	"	5°E	90%	"	"	"	"	Craters Hind, Halley Muller, & Ptolemaeus
7503	"	2,524,600	8°S	0.5°E	50%	"	"	55-60	"	Craters Ptolemaeus Herschel & Miller
7504	"	"	7.5°S	0.5°W	90%	"	"	"	"	Craters Müller, Hersche and Ptolemaeus

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7505	80	2,669,700	7.5°S	1.0°W	80%	Med	Good	55-60	W	Craters Muller, Herschel and Ptolemaeus
7506	"	"	"	3.5°W	50%	"	"	55-65	W	Craters Ptolemaeus, Herschel & LaLande C
7507	"	2,836,200	7°S	4.5°W	80%	"	"	"	"	"
7508	"	4,702,900	HORIZON		30%	"	"	70-75	"	LM Tracking Crater LaLande
7509	"	"	"	"	30%	"	"	"	"	LM Tracking, Craters LaLande & LaLande A
7510	"	"	"	"	30%	"	"	"	"	"
7511	"	"	"	"	"	"	"	"	"	"
7512	"						"	"	"	Earth View
7513	"						"			"
7514	"	3,028,700	11.5°S	9.5°W	0	"	Fair	60-65	SW	Craters Davy and Davy Y Sea of Clouds
7515	"	3,519,000	11.5°S	11.5°W	70%	"	"	65-70	"	"
7516	"	5,312,600	HORIZON		0	"	"	70-80	N	Oblique View of Copernicus Crater
7517	"	"	"	"	30%	"	"	"	"	"
7518	"	4,702,900	HORIZON		0	Low	"	70-75	SW	Area Between Craters 293 & 297
7519	"	"	HORIZON		0	"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7520	80	5,312,600	HORIZON		0	low	Fair	70-80	SW	Area Between Craters 293 and 297
7521	"	"	HORIZON		0	"	Good	70-80	NW	Crater IX
7522	"						"			Earth View
7523	"						"		"	"
7524	"		HORIZON				Poor		W	Area Just West of Crater II, Earth Rise
7525	"		"	"			"		"	Area Just West of Crater II, Earth Rise
7526	"		"	"			"		"	Area Just West of Crater II, Earth Rise
7527	"		"	"			"		"	Area Just West of Crater II, Earth Rise
7528	"		"	"			"		"	Area Just West of Crater II, Earth Rise
7529	"		"	"			"		"	Earth Rise
7530	"	4,223,400	"	"	0	Low	"	65-75	S	Crater 286 at Terminator
7531	"	1,678,600	1°S	25°W	0	Med	Fair	30-40	NE	Crater Lansberg
7532	"	"	"	26°W	80%	"	"	"	"	"
7533	"	1,944,520	2.5°N	13.5°W	0	"	Poor	40-50	N	Crater Gambart, Gambart B, and Gambart C
7534	"	2,284,700	3°N	15°W	0	"	"	50-60	"	Crater Gambart

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7535	80	3,519,000	HORIZON		30%	Med	Poor	65-70	N	Oblique View of Crater Copernicus
7536	"	3,836,800	HORIZON		"	"	"	"	"	Craters Copernicus and Reinhold B
7537	"	1,721,700	0.5°S	26.5°W	0	"	"	35-40	W	Crater Lansberg
7538	"	"	0.5°S	"	95%	"	Fair	"	"	"
7539	"	"	1°N	29°W	0	Low	Good	35-40	NW	Craters Lansberg A and Kunowsky D
7540	"	1,821,900	2°N	31.5°W	40%	"	"	35-45	W	Crater Lansberg A
7541	"	3,253,500	7°N	19.5°W	0	Med	"	60-70	N	Craters Copernicus Rheinhold A & Gambart A
7542	"	"	"	20°W	80%	"	Fair	60-70	"	Craters Copernicus & Rheinhold A
7543	"	2,669,700	2.5°N	22°W	0	"	"	55-60	NW	Craters Rheinhold & Rheinhold B
7544	"	3,519,000	10°N	26.5°W	0	"	Good	65-70	N	Craters Hortensius & Hortensius E
7545	"	"	9.5°N	28°W	80%	"	"	"	"	"
7546	"	3,836,200	"	31°W	50%	"	"	"	"	Craters Hortensius A & Hortensius B
7547	"	4,702,900	HORIZON		0	Low	"	70-75	NW	Craters Kunowsky, Encke and Kepler
7548	"	2,016,100	3.5°N	32.5°W	0	"	"	45-50	NW	Craters Kunowsky and Hortensius A
7549	"	3,028,700	8.5°N	34°W	30%	"	"	60-65	N	Craters Kepler A, Kepler B and Hortensius A

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7550	80	3,253,500	7.5°N	36.5°W	30%	Low	Good	60-70	NW	Craters Encke and Kepler
7551	"	2,397,200	4.5°N	36.5°W	30%	"	"	50-60	W	Craters Encke & Kepler
7552	"	3,253,500	11°N	32.5°W	0	"	"	60-70	N	Craters Kepler B & Milichius A
7553	"	3,519,000	12°N	34°W	70%	"	"	65-70	N	"
7554	"	2,836,200	2.5°N	116.5°E	0	Med	"	60-65	NW	Area Between Craters 206-211
7555	"	3,519,000	6°N	121°E	40%	"	"	65-70	N	Oblique View looking North into Crater 211
7556	"	1,721,700	5°S	119°E	0	Med	Good	30-40	N	Area Just West of Crater 277
7557	"	2,836,200	0°	114.5°E	0	"	"	60-65	NW	Craters 206, 277, 275, and 277
7558	"	1,572,100	5.5°S	114.5°E	30%	"	"	25-35	NW	Southern Half of Crater 277
7559	"	3,519,000	1,5°N	110°E	0	"	"	65-70	NW	Craters 202, 204, 207 and 275
7560	"	3,253,500	0°	108.5°E	60%	"	"	"	"	Craters 202, 204 and 273
7561	"	1,880,100	6°S	109.5°E	20%	"	"	40-45	NW	Crater 273
7562	"	3,028,700	1°S	116.5°E	0	"	"	60-65	NE	Crater 277
7563	"	"	2°S	103.5°E	0	High	"	"	NW	Crater 270
7564	"	2,669,700	9.5°S	113.5°E	0	"	Fair	55-65	E	Crater 276

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7565	80	3,028,700	5°S	84°E	0	High	Good	60-65	NW	Craters 263, Smyths Sea
7566	"	"	7°S	79°E	30%	"	"	"	"	Crater Kastner
7567	"	2,524,600	10°S	75.5°E	0	"	"	55-60	NW	Craters LaPerouse & LaPerouse E
7568	"	"	9°S	66.5°E	0	"	"	"	NW	Crater Langrenus A
7569	"	3,028,700	8°S	61.5°E	50	"	"	60-65	NW	Crater Langrenus
7570	"	3,519,000	10.5°S	29.5°E	0	"	"	65-70	W	Craters Daguerre & Madler, Sea of Nectar
7571	"	2,669,700	22.5°S	37.°E	0	"	"	55-69	S	Craters Fracastorius B, Central peaks of Piccolomini
7572	250	969,200	10°N	31.5°W		Low	Poor	60-65	N	Craters Milichius and Milichius A
7573	"	907,600	9.5°N	32.5°W		"	"	55-65	N	Crater Milichius A
7574	"	854,300	9°N	34°W		"	"	55-60	N	Ocean of Storms
7575	"	"	"	35°W		"	"	"	"	Crater Kepler B
7576	"	807,900	7.5°N	35°W		"	"	"	"	"
7577	"	"	"	36°W		"	"	"	"	Craters A & Kepler B
7578	"	1,126,100	9.5°N	34°W		"	"	60-70	N	Just North of Kepler B
7579	80	3,836,200	HORIZON		0	High	Good	65-75	S	Craters Alphonsus & Arzachel

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7580	80	3,836,200	HORIZON		90%	High	Good	65-75	S	Craters Alphonsus, Arzachel & Alpetragius
7581							"			Almost total eclipse of Earth
7582							"			Earth View
7583							"			"
7584							"			Solar Eclipse
7585							"			"
7586							"			"
7587							"			"
7588										Star Shot

LEC 12900

MAGAZINE S

(Frames AS12-52-7589 thru Frames 7762)

Magazine S, AS12-52, is black and white orbital coverage of the Lunar Surface taken from an average altitude of 60mm. It consists of 173 frames numbered from 7589 through 7762 with 80mm, 250mm and 500mm lenses being used.

The coverage ranges from 130° East longitude to 45° West longitude and 15°North latitude to about 50° South latitude. Photo quality ranges from poor to good.

Frames 7489 through 7600, TO-35, are 80mm low oblique stereo coverage of Fra Mauro. All frames are of good quality.

Frames 7669 through 7709 are poor to good quality 500mm, low oblique to near vertical stereo coverage of Fra Mauro. The frames are partially exposed due to a camera shutter malfunction. Frames 7631 through 7668 are poor to good quality, low oblique 500mm, stereo coverage of Descartes. Frames 7645 through 7668 are partially exposed due to a camera shutter malfunction.

Frames 7601 through 7630 and 7710 through 7762 were taken with a 250mm lens. Frames 7605 through 7630 are 250mm, low oblique to near vertical, stereo coverage of the southern edge of Herschel.

The photo quality is fair to good. Frames 7735 and 7738 through 40 are 250mm high oblique exposures of Copernicus. The photo quality is good. Frames 7761 and 7762 are blurred and not plottable.

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Magazine S Film B&W (S0164)

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7589	80	1:1,678,690	5.6°S	13.4°W	95%	Low	Good	30-35°	SW	Fra Mauro T035
7590	"	" "	5.5°S	14.2°W	95%	"	"	"	"	"
7591	"	1:1,604,100	4.4°S	14.4°W	95%	"	"	"	S	"
7592	"	"	4.7°S	15.8°W	90%	"	"	"	"	"
7593	"	"	4.9°S	16.0°W	90%	"	"	"	"	"
7594	"	1:1,517,100	4.9°S	16.0°W	90%	"	"	20-25°	E	"
7595	"	1:1,821,900	"	17.4°W	85%	"	"	35-40°	W	"
7596	"	1:1,769,300	4.7°S	17.8°W	"	"	"	35-40°	W	"
7597	"	1:1,769,300	4.9°S	18.2°W	"	"	"	"	SW	"
7598	"	1:1,821,900	4.7°S	19.2°W	95%	"	"	"	"	"
7599	"	1:1,678,600	4.8°S	19.3°W	90%	"	"	"	"	"
7600	"	1:1,517,100	4.1°S	18.4°W	95%	"	"	25-30°	"	"
7601	250	1:767,100	12.6°	S65.7°E	95%	"	"	55-60°	SSW	Directly East of Langrenus G
7602	"	" "	12.7°	S65.3°E	95%	"	"	"	"	Between Lame, Langrenus P and Langrenus G
7603	"	"	12.6°	S65.0°E	95%	"	"	"	"	"

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Magazine S Film B&W (S0154)

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7604	250	1:699,200	6.6°S	01.7°E		High	Good	45-51°	W	Between Muller and Herschel TO-26
7605	"	1:622,200 1:699,200	6.4°S	2.6°W	95%	"	"	45-51°	W	TO-27 Southern edge of Herschel
7606	"	"	6.3°S	2.7°W	95%	"	"	"	"	"
7607	"	"	"	2.4°W	"	"	"	"	"	"
7608	"	"	"	"	"	"	"	"	"	"
7609	"	"	"	"	"	"	"	"	"	"
7610	"	"	"	"	"	"	"	"	"	"
7611	"	"	"	"	"	"	"	"	"	"
7612	"	"	"	"	"	"	"	"	"	"
7613	"	"	"	"	90%	"	Fair	"	"	"
7614	"	"	6.4°S	2.6°W	"	"	"	"	"	"
7615	"	"	6.3°S	"	95%	"	"	"	"	"
7616	"	"	6.4°S	2.4°W	90%	"	Good	"	"	"
7617	"	"	"	2.1°W	80%	"	"	"	"	"
7618	"	"	"	"	"	Med	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7634	500	1:1,222,000	8.8°S	15.3°E	95%	Med	Good	15-20°	W	Area of Descartes centered between Taylor, Dolland, Dolland B, and Kant D. TO-18
7635	"	"	"	"	"	"	"	"	"	"
7636	"	"	"	"	"	"	"	"	"	"
7637	"	"	"	"	"	"	"	"	"	"
7638	"	"	"	"	"	"	"	"	"	"
7639	"	"	"	"	"	"	"	"	"	"
7640	"	"	"	"	"	"	Fair	"	"	"
7641	"	"	"	"	"	"	"	"	"	"
7642	"	"	"	"	"	"	"	"	"	"
7643	"	"	"	"	"	"	"	"	"	"
7644	"	"	"	"	"	"	"	"	"	"
7645	"	"	"	"	"	"	"	"	"	" Partial Frame
7646	"	"	"	"	"	"	Poor	"	"	"
7647	"	"	"	"	"	"	"	"	"	"
7648	"	"	"	"	"	"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7649	500	1:1,222,000	8.8°S	15.3°E	95%	Med.	Poor	15-20°	W	Area of Descartes centered between Taylor, Dolland, Dolland B, and Kant D. 10-18 Partial Frame
7650	"	"	"	"	"	"	"	"	"	"
7651	"	"	"	"	"	"	"	"	"	"
7652	"	"	"	"	"	"	"	"	"	"
7653	"	"	"	"	"	"	"	"	"	"
7654	"	"	"	"	"	"	"	"	"	"
7655	"	"	"	"	"	"	"	"	"	"
7656	"	"	"	"	"	"	"	"	"	"
7657	"	"	"	"	"	"	"	"	"	"
7658	"	"	"	"		"	"	"	"	"
7659	"	"	"	"		"	"	"	"	"
7660	"	"	"	"		"	"	"	"	"
7661	"	"	"	"		"	"	"	"	"
7662	"	"	"	"		"	"	"	"	"
7663	"	"	"	"		"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7664	500	1:1,222,000	8.8°S	15.3°E		Med.	Fair	15-20°	W	Area of Descartes centered between Taylor, Dollond, Dollond B. and Kant D. Partial Frame
7665	"	"	"	"		"	"	"	"	"
7666	"	"	"	"		"	"	"	"	"
7667	"	"	"	"		"	"	"	"	"
7668	"	"	"	"		"	"	"	"	"
7669	500	1:1,222,000	3.8°S	17.4°W	0%	High	Poor	10-15°	WSW	Southwest of Fra Mauro G. and Southeast of Fra Mauro J. (Partial Frame)
7670	"	"	"	"	97%	"	"	"	"	"
7671	"	"	"	"	"	"	"	"	"	"
7672	"	"	"	"	99%	"	"	"	"	"
7673	"	"	"	"	94%	"	"	"	"	"
7674	"	"	"	"	95%	"	"	"	"	"
7675	"	"	"	"	100%	"	"	"	"	"
7676	"	"	"	"	95%	"	"	"	"	"
7677	"	"	"	"	"	"	"	"	"	"
7678	"	"	"	"	80%	"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7679	500	1:1,222,000	3.8°S	17.4°W	75%	High	Poor	10-15°	WSW	Southwest of Fra Mauro G. and Southeast of Fra Mauro J. (Partial Frame)
7680	"	"	"	"	80%	"	"	"	"	"
7681	"	"	"	"	"	"	"	"	"	"
7682	"	"	"	"	"	"	"	"	"	"
7683	"	"	"	"	75%	"	"	"	"	"
7684	"	"	"	"	80%	"	"	"	"	"
7685	"	"	"	"	"	"	"	"	"	"
7686	"	"	"	"	75%	"	"	"	"	"
7687	"	"	"	"	75%	"	"	"	"	"
7688	"	"	"	"	"	"	"	"	"	"
7689	"	"	"	"	80%	"	"	"	"	"
7690	"	"	"	"	75%	Med	Fair	"	"	"
7691	"	"	"	"	80%	"	"	"	"	"
7692	"	"	"	"	75%	"	Good	"	"	"
7693	"	"	"	"	80%	"	"	"	"	"

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7694	500	1:1,222,000	3.8°S	17.4°W	85%	Med.	Good	5-10°	WSW	Southwest of Fra Mauro G. and Southeast of Fra Mauro J. Partial Frame
7695	"	"	"	"	"	"	"	"	"	"
7696	"	"	"	"	80%	"	"	"	"	"
7697	"	"	"	"	85%	"	"	"	"	"
7698	"	"	"	"	90%	"	"	"	"	"
7699	"	"	"	"	80%	"	"	"	"	"
7700	"	"	"	"	85%	"	"	"	"	"
7701	"	"	"	"	"	"	"	"	"	"
7702	"	"	"	"	"	"	"	"	"	"
7703	"	"	"	"	"	"	"	"	"	"
7704	"	"	"	"	90%	"	"	"	"	"
7705	"	"	"	"	80%	"	"	"	"	"
7706	"	"	"	"	95%	Low	Good	"	SWS	"
7707	"	"	"	"	"	"	"	"	"	"
7708	"	"	"	"	"	"	"	"	"	"

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Magazine S Film B&W (SO164)

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Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7709	500	1:1,222,000	3.8°S	17.4°W	95%	Low	Good	5-10°	WSW	Southwest of Fra Mauro G and Southeast of Fra Mauro J. (Partial Frame
7710	250	1:1,041,100	2.0°N	126°E	95%	"	Poor	60-70°	NE	Craters 283, 282 looking Northeast. TO-4
7711	"	"	1.6°N	125.9°E	"	"	"	"	"	"
7712	"	"			"	"	Fair	"	"	Unplottable due to photography
7713	"				"	"	"		"	"
7714	"	1:767,100	4.7°S	38.3°E	"	Med	Good	50-55°	NW	Censorinus F looking Northwest TO-14
7715	"	"	4.2°S	"	"	"	"	"	"	"
7716	"	1:767,100 1:907,600	3.7°S	22.2°E	"	"	"	55-61°	N	Hypatia looking North TO-16
7717	"	"	3.1°S	21.2°E	"	"	"	"	NW	Alfraganus D.F.G. & Hypatia & Hypatiac, looking North TO-16
7718	"	1:907,600 1:1,041,100	2.5°S	20.0°E	80%	"	"	61-65°	NNW	Alfraganus F looking NW to Schmidt & Dionysius TO-16
7719	"	1:907,600	"	21.5°E	80%	"	"	60-65°	N	Alfraganus F looking N to Hypatia C. & Sabine TO-16
7720	"	1:513,300 1:537,100	4.1°S	20.9°E	80%	"	"	31-35°	N	Alfraganus D, F, & G looking N. TO-16
7721	"	1:1,041,100 1:1,351,500	3.0°N	14.3°E	95%	High	Good	65-71°	"	d'arrest looking N to Rima Ariadaeus
7722	"	1:907,600 1:041,100	3.3°N	14.5°E	90%	High	Good	61-65°	"	d'Arrest looking N to Rima Ariadaeus
7723	"	1:907,600	0°	6.1°E	95%	Med	"	60-65°	"	Lade looking N to Agrippa TO-22

LEC 12969

APOLLO 12 PHOTOGRAPHY

Magazine S Film B&W (S0164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7724	250	1:907,600	.08°N	8.2°E	80%	Med	Good	60-65°	NNE	Western Edge of Lade looking N to Dembowski TO-22
7725	"	"	.02°N	7.2°E	"	"	"	"	NW	Directly W of Lade Godin & Agrippa looking N across Dambowski TO-22
7726	"	1:1,041,100	.7°N	3.5°E	60%	High	"	"	NW	Rhaeticus looking NW across Triesnecker
7727	"	"	.7°N	4.5°E	65%	"	"	"	"	"
7728	"	"	6.8°N	3.1°W	95%	Med	"	"	N	Pallas, Bode looking N to Rima Bode I TO-28
7729	"	"	6.8°N	4.1°W	90%	"	"	"	"	Rima Bode IV looking N to Rima Bode I, Bode & Bode B. TO-28
7730	"	"	8.9°N	5.1°W	85%	"	"	"	NW	Rima Bode IV looking NE to Sinus Aestuum TO-28
7731	"	1:1,041,100 1:1,351,500	5.7°N	7.7°W	90%	"	"	65-71°	NW	Schroter looking North to Schroter C & Sinus Aestuum.
7732	"	"	5.0°N	8.4°W	85%	"	"	"	"	Schroter G looking N to Schroter C & Sinus Aestuum
7733	"	1:1,041,100	5.0°N	8.6°W	90%	"	"	"	N	"
7734	"	"	5.4°N	9.9°W	85%	"	"	"	N	"
7735	"	1:1,041,100 1:1,351,500	9.7°N	19.7°W		"	"	65-71°	NNW	Copernicus & Copernicus H looking NW
7736	"	1:767,100 1:907,600	1.4°N	15.3°W		"	"	55-61°	N	Gambart looking N & including Gambart EA TO-34
7737	"	1:622,200 1:699,200	1.0°N	18.8°W		"	"	45-51°	NW	Gambart A looking NW
7738	"	1,041,100 1,351,500	9.6°N	19.3°W	80%	"	"	65-71°	N	Copernicus TO-37

APOLLO 12 PHOTOGRAPHY

Magazine S Film B&W (S0164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7739	250	1,041,100	10°N	20°W	80%	Med	Good	60-65°	N	Copernicus TO-37
7740	"	1,351,500	0.4°N	21.7°W	80%	"	"	70-75°	N	"
7741	"	907,600 1,041,100	6.5°N	29.4°W	85%	"	"	61-65°	"	Hortensius B looking N to Milichius
7742	"	1,041,100	6.8°N	20.0 W	"	"	"	"	NW	"
7743	"	907,600	11.4°N	31.3°W	80%	"	"	"	N	Milichius & Milichius A
7744	"	1,041,100	7.2°N	31.8°W	80%	"	"	"	"	Milichius A
7745	"	1,041,100 1,351,500	8.3°N	38.3°W		"	"	65-71°	NW	Kepler, Kepler A. Kepler F TO-43
7746	"	622,200 699,200	2.1°N	32.5°W		"	"	45-51°	"	Kunowsky TO-42
7747	"	907,600	8.1°N	38.3°W		"	"	60-65°	"	Kepler, Kepler F TO-43
7748	"	440,600 448,200	.07°N	36.5°W	80%	Low	"	3-11°	SSW	Encke C TO-47
7749	"	699,200	4.5°S	44.0°W	"	"	"	50-55°	SE	TO-50 Flamsteed, Flamsteed B
7750	"	583,000	1.0°N	45.1°W	"	"	"	"	NW	Suess F TO-48
7751	"	1,351,500	6.4°N	53.1°W	"	"	"	70-75°	WNW	Reiner, Reiner A TO-53
7752	"	699,200	4.4°N	47.3°W	80%	"	"	50-55°	NW	Suess, Suess D
7753	"	"	5.0°N	43.2°W	80%	"	"	"	"	Suess

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APOLLO 12 PHOTOGRAPHY

Magazine S Film B&W (S0164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7754	250	1,041,100 1,227,800				Low	Fair	65-70°	NW	West Central Ocean of Storms near Terminator (not plottable)
7755	"					"			W	"
7756	"	907,600	7.0°N	54.2°W		"	Good but partially blurred	60-65°	WSW	Reiner Looking North TO-53
7757	"	"	12.8°N	50.3°W	80%	Med	"	"	N	Marius TO-52
7758	"	907,600 1,041,100	7.9°N	54.9°W	80%	Low	"	61-65°	NW	Reiner Looking NE TO-53
7759	"	"	13.9°N	51.5°W	80%	"	"	"	N	Marius TO-52
7760	"									Photography Blurred Not Plottable
7761	"									Not Plottable, Blurred
7762	"	"								Not Plottable, Blurred

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MAGAZINE T

(Frames AS12-54-7948 thru 8120)

Magazine T is 70mm black and white photography of the lunar surface, taken from the Command Module. The entire magazine is a near vertical stereo strip photographed with an 80mm lens. The approximate coverage is from 125°E 3°S to 55°W 3°N. The quality of the photography ranges from poor to good with sun angles from low to high.

Frames 8083 thru 8091 contain the north tip of Fra Mauro to Landing Site 7. Site 5 is shown on 8108-8109. The Target of Opportunity coverage is as follows: Number 8 on frames 7954-7957; Number 13 on 8028-8029; 15 on 8033-8035; 18 on 8048-8051; 23 on 8056-8059; 26 on 8065-8066; 27 on 8068-8070; 32 on 8075-8077; 35 partially imaged on 8083-8084; 39 on 8087-8098; and 48 on 8108-8111.

APOLLO 12 PHOTOGRAPHY

Magazine T 70mm Film SO-164 B&W

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7948	80mm	1:1,376,900	3°S	123°E	60	Low	Poor	Near Vert	Near Vert	Not Usable (Too dark)
7949	"	"	4°S	121.5E	60	Low	Poor	Near Vert	Near Vert	Stereo Strip Usable (Dark)
7950	"	"	4°S	121° E	65	"	"	"	"	Stereo Strip Usable (Dark)
7951	"	"	4.5S	120° E	65	"	"	"	"	Stereo Strip (SE of 277) Usable (Dark)
7952	"	"	4.5S	119° E	60	"	"	"	"	Stereo Strip, SE of 277
7953	"	"	4.5S	117.5E	65	"	"	"	"	Stereo Strip, SE of 277
7954	"	"	5° S	116.5E	70	"	"	"	"	Stereo Strip (T.0.8) SSE of 277
7955	"	"	5° S	116° E	70	"	"	"	"	Stereo Strip (T.0.8) So. Part of 277
7956	"	"	5.5S	115° E	65	"	"	"	"	Stereo Strip (T.0.8) So. Part of 277
7957	"	"	5.5S	114° E	65	"	"	"	"	Stereo Strip (T.0.8) So. Part of 277
7958	"	"	6°S	113° E	65	"	Fair	"	"	Stereo Strip S.E. Part of 273
7959	"	"	6°S	111.5E	65	"	"	"	"	Stereo Strip S Part of 273
7960	"	"	6°S	110.5E	65	"	"	"	"	Stereo Strip S Part of 273
7961	"	"	6°S	109.5E	60	"	"	"	"	Stereo Strip S Part of 273
7962	"	"	6.5S	108.5E	65	"	"	"	"	Stereo Strip SW of Crater 273

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APOLLO 12 PHOTOGRAPHY

Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7963	80mm	1:1,376,900	6°.5S	108°E	65	Low	Fair	Near Vert	Near Vert	Stereo Strip SW of Crater 273
7964	80mm	1:1,376,900	7° S	107°E	65	Low	Fair	Near Vert	Near Vert	Stereo Strip SW of Crater 273
7965	"	"	7°0'S	106°E	65	"	"	"	"	" "
7966	"	"	7° S	105°E	70	"	"	"	"	" "
7967	"	"	7° S	104°E	65	"	"	"	"	Stereo Strip SE of Crater 270
7968	"	"	7°.5S	103°E	62	"	"	"	"	Stereo Strip S of Crater 270
7969	"	"	7°.5S	102°0'E	65	"	"	"	"	" "
7970	"	"	8° S	101°E	65	"	"	"	"	" "
7971	"	"	8° S	100°E	62	"	"	"	"	" SW of Crater 270
7972	"	"	8°0'S	99°E	65	"	"	"	"	" "
7973	"	"	8°S	98°E	68	"	"	"	"	" "
7974	"	"	8°0'S	97°E	65	"	"	"	"	" SE of Crater 266
7975	"	"	8°S	96°0'E	65	Med.	Good	"	"	" "
7976	"	"	8°.5S	95°E	62	Med.	Good	"	"	" SE Part of Crater 266
7977	"	"	8°.5S	94°E	62	"	"	"	"	" "

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Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7978	80mm	1:1,376,900	8°.5S	93°E	67	Med.	Good	Near Vert	Near Vert	Stereo Strip S Part of Crater 266
7979	"	"	9°S	92°E	65	"	"	"	"	" "
7980	"	"	9°S	90°.5E	65	"	"	"	"	Stereo Strip SW of Crater 266
7981	"	"	9°S	89°.5E	65	"	"	"	"	" SE of Crater 263
7982	"	"	9°0'S	88°.5E	65	"	"	"	"	" "
7983	"	"	9°S	87°.5E	65	"	"	"	"	" "
7984	"	"	9°.5S	86°.5E	65	"	"	"	"	" S of Crater 263
7985	"	"	9°.5S	85°.5E	65	"	"	"	"	" "
7986	"	"	9°.5S	84°.5E	65	"	"	"	"	" "
7987	"	"	10°S	83°.5E	65	"	"	"	"	" "
7988	"	"	10°S	82°E	63	"	"	"	"	" SW of Crater 263
7989	"	"	10°S	81°E	65	"	"	"	"	" "
7990	"	"	10°0'S	80°E	65	"	"	"	"	La Perouse E Ansgarius M Shown
7991	"	"	10°S	79°E	65	"	"	"	"	"
7992	"	"	10°S	78°E	65	"	"	"	"	"

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APOLLO 12 PHOTOGRAPHY

Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7993	80mm	1:1,376,900	10°S	77°0'E	65	Med.	Good	Near Vert	Near Vert	La Perouse
7994	"	"	10°S	76°0'E	65	"	"	"	"	"
7995	"	"	10°S	75°E	65	"	"	"	"	"
										Stereo Strip Frames 7996-8011
7996	80mm	1:1,376,900	10°S	74°E	65	Med.	Good	Near Vert	Near Vert	West Part of LaPerouse Crater
7997	"	"	10°5S	73°0'E	65	"	"	"	"	West of La Perouse
7998	"	"	10°5S	72°0'E	65	"	"	"	"	Crater Kapteyn Shown
7999	"	"	10°5S	71°E	65	"	"	"	"	"
8000	"	"	10°5S	70°E	65	"	"	"	"	"
8001	"	"	10°5S	69°E	65	"	"	"	"	Crater Langrenusa
8002	"	"	11°S	68°0'E	65	"	"	"	"	"
8003	"	"	10°5S	67°E	67	"	"	"	"	Craters Langrenus A and G Shown
8004	"	"	11°S	66°E	65	"	"	"	"	"
8005	"	"	11°S	65°E	65	"	"	"	"	Craters Langrenus A, G, and P Shown
8006	"	"	11°S	64°E	63	"	"	"	"	" Also S. tip of Langrenus

APOLLO 12 PHOTOGRAPHY

Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8007	80mm	1:1,376,900	11°S	62.5°E	65	Med.	Good	Near Vert	Near Vert	Craters Langrenus A,G,& P Shown - Also south tip of Langrenus
8008	"	"	12°S	61.5°E	65	"	"	"	"	"
8009	"	"	11°S	61°E	65	"	Fair	"	"	"
8010	"	"	11°S	59.5°E	65	"	"	"	"	SW Section of Langrenus
8011	"	"	11°S	58.5°E	65	"	"	"	"	"
8012	"	"	11°S	57.5°E	68	"	"	"	"	Langrenus D Stereo Strip
8013	"	"	11°S	56.5°E	65	"	"	"	"	" "
8014	"	"	11°S	55°E	65	"	"	"	"	" "
8015	"	"	11°S	54°E	65	"	"	"	"	Southwest of Langrenus "
8016	"	"	11°S	53°E	65	"	"	"	"	" "
8017	"	"	11°S	52°E	65	"	"	"	"	" "
8018	"	"	11°0'S	51°E	65	"	"	"	"	North of Crozier "
8019	"	"	11°S	50°E	63	"	"	"	"	" "
8020	"	"	11°S	49°E	65	"	"	"	"	" "
8021	"	"	11°S	48°E	63	"	"	"	"	Sea of Fertility "

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Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description	
			Lat	Long							
8022	80mm	1:1,376,900	11°S	57.5E	65	Med.	Fair	Near Vert	Near Vert	Sea of Fertility	Stereo Strip
8023	"	"	11°S	45.5E	65	"	"	"	"	"	"
8024	"	"	11°S	44.5E	65	"	"	"	"	Gutenberg D	"
8025	"	"	10.5S	43.5E	65	High	"	"	"	"	"
8026	"	"	11°S	43°E	65	"	"	"	"	"	"
8027	"	"	11°S	42°E	65	"	"	"	"	"	"
8028	"	"	11°S	40.5E	65	"	"	"	"	Stereo Strip	(T.O. 13)
8029	"	"	11°S	39.5E	65	"	"	"	"	"	(T.O. 13)
8030	"	"	10.5S	38.5E	65	"	"	"	"	"	Gaudibert Crater
8031	"	"	10.5S	37.5E	65	"	"	"	"	"	"
8032	"	"	10.5S	36.5E	65	"	"	"	"	"	"
8033	"	"	10.5S	35.5E	65	"	"	"	"	"	(T.O. 15)
8034	"	"	10.5S	34.5E	65	"	"	"	"	"	(T.O. 15) North Portion of Paguerre
8035	"	"	10°S	33.5E	65	"	"	"	"	"	(T.O. 15)
8036	"	"	10°S	32.5E	65	"	"	"	"	"	North Portion of Paguerre

APOLLO 12 PHOTOGRAPHY

Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description	
			Lat	Long							
8037	80mm	1:1,376,900	10°S	31°0'E	65	High	Fair	Near Vert	Near Vert	Stereo Strip	Crater Madler
8038	"	"	10°S	30°E	65	"	"	"	"	"	"
8039	"	"	10°S	29°E	65	"	"	"	"	"	"
8040	"	"	10°S	28°0'E	63	"	"	"	"	"	Crater Madler (North half of Theophilus)
8041	"	"	10°S	27°E	65	"	"	"	"	"	North Half of Theophilus
8042	"	"	10°S	26.5E	65	"	Poor	"	"	"	"
8043	"	"	9°S	25°E	65	"	"	"	"	"	"
8044	"	"	8.5S	24°E	66	"	"	"	"	"	NW of Theophilus
8045	"	"	8.5S	23°0'E	63	"	"	"	"	"	Kant C Crater
8046	"	"	8.5S	22°E	65	"	"	"	"	"	"
8047	"	"	9°S	21°E	65	"	"	"	"	"	Kant Crater
8048	"	"	9°S	19.5E	65	"	"	"	"	"	Kant G Crater
8049	"	"	9°S	19°E	65	"	"	"	"	"	(T.O. 18)
8050	"	"	9°S	18°E	65	"	"	"	"	"	"
8051	"	"	9°S	17°0'E	65	"	"	"	"	"	"

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Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8052	80mm	1:1,376,900	9°S	16°E	65	High	Poor	Near Vert	Near Vert	Stereo Strip S 3/4 of Dolland B
8053	"	"	9°S	15°E	65	"	"	"	"	" Dolland Crater
8054	"	"	8°S	13°.5E	65	"	"	"	"	" Dolland B Crater
8055	"	"	8°S	13°.5E	65	"	"	"	"	" Andel F Crater
8056	"	"	8°S	11°.5E	65	"	"	"	"	" "
8057	"	"	8°01'S	10°.5E	65	"	"	"	"	" E. of Hind (T.O. 23)
8058	"	"	8°S	9°E	65	"	"	"	"	" "
8059	"	"	8°.5S	8°E	65	"	"	"	"	" Crater Hind (T.O. 23)
8060	"	"	7°.5S	7°.5E	65	"	"	"	"	" Crater Hind Shown
8061	"	"	7°.5S	6°.5E	65	"	"	"	"	" Craters Hind & Halley
8062	"	"	7°S	5°.5E	65	"	"	"	"	" Crater Hálley
8063	"	"	7°S	4°E	65	"	Fair	"	"	" Hipparchus
8064	"	"	7°01'S	3°.5E	65	"	"	"	"	" "
8065	"	"	7°S	2°.5E	65	"	"	"	"	" Crater Muller (T.O. 26)
8066	"	"	6°.5S	1°.5E	65	"	"	"	"	" (T.O. 26)

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Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8067	80mm	1:1,376,900	6°S	0°E	65	High	Fair	Near Vert	Near Vert	Stereo Strip East of Herschel
8068	"	"	6°S	1°W	65	"	"	"	"	" Crater Herschel (T.O. 27)
8069	"	"	6°S	2°W	68	"	Good	"	"	" "
8070	"	"	6°S	3°W	65	"	"	"	"	" "
8071	"	"	6°S	4°W	65	"	"	"	"	" "
8072	"	"	6°S	5°W	65	Med.	"	"	"	" Herschel D
8073	"	"	5.5S	6°W	65	"	"	"	"	" La Lande C
8074	"	"	5.5S	7°W	65	"	"	"	"	" "
8075	"	"	5°S	8°W	65	"	"	"	"	" Crater La Lande (T.O. 32)
										Stereo Strip Frames 8076 - 8091
8076	"	"	5°S	9°W	65	Med.	"	Near Vert	Near Vert	Crater La Lande (T.O. 32)
8077	"	"	5°S	10°W	65	"	"	"	"	West Half of La Lande "
8078	"	"	4.5S	11°W	65	"	"	"	"	West of La Lande and NE of Fra Mauro
8079	"	"	4.5S	12°W	65	"	"	"	"	"
8080	"	"	4°S	13°W	65	Low	"	"	"	NE of Fra Mauro

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Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8081	80mm	1:1,376,900	4°S	14°W	65	Low	Good	Near Vert	Near Vert	NE of Fra Mauro
8082	"	"	4°S	15°W	65	"	"	"	"	Northern Section of Fra Mauro
8083	"	"	4°S	16°W	65	"	"	"	"	Northern Tip of Fra Mauro (T.O. 35 Partical)
8084	"	"	3.5S	17°W	65	"	"	"	"	"
8085	"	"	3°S	18°W	65	"	"	"	"	Fra Mauro J
8086	"	"	2.5S	19°W	65	"	"	"	"	Crater Fra Mauro J
8087	"	"	3.5S	20°W	65	"	Fair	"	"	(T.O. 39)
8088	"	"	3°S	21°W	65	"	"	"	"	"
8089	"	"	2°S	22°W	65	"	"	"	"	"
8090	"	"	2°S	23°W	65	"	"	"	"	Site 7 "
8091	"	"	3°S	24°W	65	"	"	"	"	"
										Stereo Strip Frames 8092 - 8107
8092	80mm	1:1,376,900	2°S	25°W	65	Low	Fair	Near Vert	Near Vert	(T.O. 39)
8093	"	"	1.5S	26°W	65	"	"	"	"	"
8094	"	"	2°S	27°W	70	"	"	"	"	South Half of Lansberg "

APOLLO 12 PHOTOGRAPHY

Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
										Stereo Strip Frames 8092-8107 Cont'd.
8095	80mm	1:1,376,900	1°.5S	28°W	70	Low	Fair	Near Vert	Near Vert	South Half of Lansberg (T.O. 39)
8096	"	"	1°.5S	29°W	70	"	"	"	"	"
8097	"	"	1°.5S	30°W	65	"	"	"	"	"
8098	"	"	1°S	31°W	65	"	"	"	"	"
8099	"	"	1°S	32°W	60	"	"	"	"	Lansberg A & Kunowsky C
8100	"	"	0°.5S	33°W	65	"	"	"	"	Kunowsky C
8101	"	"	0°	34°W	65	"	"	"	"	Lansberg F, C, & E of Enckec
8102	"	"	0°	35°W	65	"	"	"	"	"
8103	"	"	0°.5N	36°W	65	"	"	"	"	Encke C
8104	"	"	0°	36°.5W	65	"	"	"	"	"
8105	"	"	0°.5N	37°.5W	65	"	"	"	"	West of Encke C
8106	"	"	1°N	38°.5W	70	"	"	"	"	East of Encke E
8107	"	"	1°N	40°W	65	"	"	"	"	Encke E & Maestlin G
8108	"	"	1°N	41°W	70	"	"	"	"	Stereo Strip (T.O. 48)

LEC 12969

APOLLO 12 PHOTOGRAPHY

Magazine T 70mm Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8109	80mm	1:1,376,900	1°.5N	42°W	70	Low	Fair	Near Vert	Near Vert	Stereo Strip (T.O. 48)
8110	"	"	1°.5N	43°W	65	"	"	"	"	" "
8111	"	"	2°N	43°.5W	70	"	"	"	"	" "
8112	"	"	2°N	45°.5W	65	"	"	"	"	" Suess F Crater
8113	"	"	2°N	46°W	70	"	"	"	"	" West of Suess F Crater
8114	"	"	2°.5N	47°W	70	"	"	"	"	" East of Reiner E Crater
8115	"	"	2°.5N	48°W	70	"	Poor	"	"	" Reiner E Crater
8116	"	"	3°N	49°W	70	"	"	"	"	" "
8117	"	"	3°N	50°W	70	"	"	"	"	" Southwest of Suess Crater
8118	"	"	3°.5N	51°W	70	"	"	"	"	" South of Reiner A Crater
8119	"	"	3°.5N	52°W	70	"	"	"	"	Too Dark (Unuseable)
8120	"	"						"	"	" "

MAGAZINE U

(Frames AS-12-53-7763 thru 7947)

Magazine U of the Appollo XII photography consists of overlapping stereoscopic 70mm black and white imagery of Fra Maura (41 frames), Descartes (41 frames), Lalande (42frames), taken using a 500mm lens. The remaining frames of the magazine are: 4 frames of the moon, probably during transearth coast, and 57 frames of the solar eclipse, 10 of which exposed during a camera malfunction.

Quality of the Fra Mauro, Descartes, and Lalande 500mm imagery ranged from fair to poor on this generation film.

Targets of Opportunity no. 18 and 32 were photographed on this magazine.

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS-12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7763	500MM	1: 450,000	9.0°S	16.0°E	95%	High	Fair	30-60°	West	Descartes
7764	"	"	"	"	"	"	"	"	"	"
7765	"	"	"	"	"	"	"	"	"	"
7766	"	"	"	"	"	"	"	"	"	"
7767	"	"	9.0°S	16.0°E	"	"	"	"	"	"
7768	"	"	"	"	"	"	"	"	"	"
7769	"	"	"	"	"	"	"	"	"	"
7770	"	1:350,000	9.0°S	16.0°E	"	"	"	"	"	"
7771	"	"	"	"	"	"	"	"	"	"
7772	"	"	"	"	"	"	"	"	"	"
7773	"	"	"	"	"	"	"	"	"	"
7774	"	"	"	"	"	"	"	"	"	"
7775	"	"	"	"	"	"	"	"	"	"
7776	"	"	"	"	"	"	"	0-30°	"	"
7777	"	"	"	"	"	"	"	"	"	"

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APOLLO 12 PHOTOGRAPHY

Magazine II Film BW

Time Reference — GET _____ = GMT _____

Frame # S-12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7778	500MM	1:350,000	9.0°S	16.0°E	95%	High	Fair	0-30°	West	Descartes
7779	"	1:300,000	"	"	"	"	"	"	"	"
7780	"	"	"	"	"	"	"	"	"	"
7781	"	"	"	"	"	"	"	"	"	"
7782	"	"	"	"	"	"	"	"	"	"
7783	"	"	"	"	"	"	"	"	"	"
7784	"	"	"	"	"	"	"	"	"	"
7785	"	"	"	"	"	"	"	"	"	"
7786	"	"	"	"	"	"	"	"	"	"
7787	"	"	"	"	"	"	"	"	"	"
7788	"	"	"	"	"	"	"	"	"	"
7789	"	"	"	"	"	"	"	"	"	"
7790	"	"	"	"	"	"	"	"	"	"
7791	"	"	"	"	"	"	"	"	"	"
7792	"	"	"	"	"	"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7793	500MM	1:300,000	9.0°S	16.0°E	95%	High	Fair	0-30°	West	Descartes
7794	"	1:222,000	"	"	"	"	"	0-20°	"	"
7795	"	"	"	"	"	"	"	"	"	"
7796	"	"	"	"	"	"	"	"	"	"
7797	"	"	"	"	"	"	"	"	"	"
7798	"	"	"	"	"	"	"	"	"	"
7799	"	"	"	"	"	"	"	"	"	"
7800	"	"	"	"	"	"	"	"	"	"
7801	"	"	"	"	"	"	"	"	"	"
7802	"	"	"	"	"	"	"	"	"	"
7803	"	"	"	"	"	"	"	"	"	"
7804	"	1:450,000	3.5S	18.0°W	"	"	"	55-65°	West	Frau Mauro
7805	"	"	"	"	"	"	"	55-60°	"	"
7806	"	"	"	"	"	"	"	"	"	"
7807	"	"	"	"	"	"	"	50-55°	"	"

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7808	500MM	1:450,000	3.5°S	18.0°W	95%	High	Fair	52°	West	Frau Mauro
7809	"	1:349,600	"	"	"	"	"	50°	"	"
7810	"	1:325,000	"	"	"	"	"	48°	"	"
7811	"	"	"	"	"	"	"	46°	"	"
7812	"	"	"	"	"	"	"	44°	"	"
7813	"	"	"	"	"	"	"	42°	"	"
7814	"	1:283,000	"	"	"	"	"	40°	"	"
7815	"	"	"	"	"	"	"	38°	"	"
7816	"	"	"	"	"	"	"	36°	"	"
7817	"	"	"	"	"	"	"	34°	"	"
7818	"	"	"	"	"	"	"	32°	"	"
7819	"	1:250,000	"	"	"	"	"	30°	"	"
7820	"	"	"	"	"	"	"	28°	"	"
7821	"	"	"	"	"	"	"	26°	"	"
7822	"	"	"	"	"	"	"	24°	"	"

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7823	500MM	1:250,000	3.5°S	18.0°W	95%	High	Fair	22°	West	Fra Mauro
7824	"	1:232,000	"	"	"	"	"	20°	"	"
7825	"	"	"	"	"	"	"	18°	"	"
7826	"	1:227,000	"	"	"	"	"	16°	"	"
7827	"	"	"	"	"	"	"	14°	"	"
7828	"	"	"	"	"	"	"	12°	"	"
7829	"	"	"	"	"	"	"	10°	"	"
7830	"	"	"	"	"	"	"	8°	"	"
7831	"	"	"	"	"	"	"	6°	"	"
7832	"	"	"	"	"	"	"	14°	"	"
7833	"	"	"	"	"	"	"	2°	"	"
7834	"	"	"	"	"	"	"	0°	Vert.	"
7835	"	1:222,000	"	"	"	"	"	0°	"	"
7836	"	"	"	"	"	"	"	0°	"	"
7837	"	"	"	"	"	"	"	0°	"	"

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APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7838	500MM	1:222,000	3.5°S	18.0°W	95%	High	Fair	2°	West	Fra Mauro
7839	"	"	"	"	"	"	"	4°	"	"
7840	"	"	"	"	"	"	"	6°	"	"
7841	"	"	"	"	"	"	"	8°	"	"
7842	"	"	"	"	"	"	"	8°	"	Fra Mauro Area
7843	"	"	"	"	"	"	"	10°	"	"
7844	"	"	"	"	"	"	"	10°	"	"
7845	"	1:450,000	5.0°S	9.5°W	"	"	"	30-60°	West	LaLande Crater
7846	"	"	"	"	"	"	"	"	"	"
7847	"	"	"	"	"	"	"	"	"	"
7848	"	"	"	"	"	"	"	"	"	"
7849	"	"	"	"	"	"	"	"	"	"
7850	"	"	"	"	"	"	"	"	"	"
7851	"	"	"	"	"	"	"	"	"	"
7852	"	"	"	"	"	"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7853	500MM	1:450,000	3.5°S	18.0°W	95%	High	Fair	30-60°	West	LaLande Crater
7854	"	1:300,000	"	"	"	"	"	"	"	"
7855	"	"	"	"	"	"	"	"	"	"
7856	"	"	"	"	"	"	"	"	"	"
7857	"	"	"	"	"	"	"	"	"	"
7858	"	"	5.0°S	9.5°W	"	High	Fair	20-30°	"	"
7859	"	"	"	"	"	"	"	"	"	"
7860	"	"	"	"	"	"	"	"	"	"
7861	"	"	"	"	"	"	"	"	"	"
7862	"	"	"	"	"	"	"	"	"	"
7863	"	"	"	"	"	"	"	"	"	"
7864	"	"	"	"	"	"	"	"	"	"
7865	"	"	"	"	"	"	"	"	"	"
7866	"	"	"	"	"	"	"	"	"	"
7867	"	"	"	"	"	"	"	"	"	"

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APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7868	500MM	1:300,000	5.0°S	9.5°W	95%	High	Fair	20-30°	West	LaLande
7869	"	"	"	"	"	"	"	"	"	"
7870	"	1:250,000	"	"	"	"	"	0-20°	"	"
7871	"	"	"	"	"	"	"	"	"	"
7872	"	"	"	"	"	"	"	"	"	"
7873	"	"	"	"	"	"	"	"	"	"
7874	"	1:222,000	"	"	"	"	"	0-15°	"	"
7875	"	"	"	"	"	"	"	"	"	"
7876	"	"	"	"	"	"	"	"	"	"
7877	"	"	"	"	"	"	"	"	"	"
7878	"	"	"	"	"	"	"	"	"	"
7879	"	"	"	"	"	"	"	"	"	"
7880	"	"	"	"	"	"	"	"	"	"
7881	"	"	"	"	"	"	"	"	"	"
7882	"	"	"	"	"	"	"	"	"	"

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7883	500MM	1:222,000	5.0°S	9.5°W	95%	High	Fair	0-15°	West	LaLande Crater
7884	"	"	"	"	"	"	"	"	"	"
7885	"	"	"	"	"	"	"	"	"	"
7886	"	"	5.0°S	9.0°W	"	"	"	"	East	"
7887	80MM					"	Good			Full Moon during Trans Earth
7888	80MM					"	Good			Full Moon during Trans Earth
7889	"					"	Fair			Quarter Moon during Trans Earth
7890	"						Fair			Quarter Moon during Trans Earth
7891	"						Good			Solar Eclipse
7892	"						"			" "
7893	"						"			" "
7894	"						"			" "
7895	"						"			" "
7896	"						"			" "
7897	"						"			" "

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APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7898	80mm						Good			Solar Eclipse
7899	"						"			" "
7900	"						"			" "
7901	"						"			" "
7902	"						"			" "
7903	"						"			" "
7904	"						"			" "
7905	"						"			" "
7906	"						"			" "
7907	"						Poor			Camera Malfunction during Solar Eclipse
7908	"						"			" "
7909	"						"			" "
7910	"						"			" "
7911	"						"			" "
7912	"						"			" "

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12=53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7913	80mm						Poor			Camera Malfunction during Solar Eclipse
7914	"						"			" "
7915	"						"			" "
7916	"						"			" "
7917	"						"			" "
7918	"						Good			Solar Eclipse
7919	"						"			" "
7920	"						"			" "
7921	"						"			" "
7922	"						"			" "
7923	"						"			" "
7924	"						"			" "
7925	"						"			" "
7926	"						"			" "
7927	"						"			" "

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APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
7928	80mm						Good			Solar Eclipse
7929	"						"			" "
7930	"						"			" "
7931	"						"			" "
7932	"						"			" "
7933	"						"			" "
7934	"						"			" "
7935	"						"			" "
7936	"						"			" "
7937	"						"			" "
7938	"						"			" "
7939	"						"			" "
7940	"						"			" "
7941	"						"			" "
7942	"						"			" "

APOLLO 12 PHOTOGRAPHY

Magazine U Film BW

Time Reference — GET _____ = GMT _____

Frame # AS12-53	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7943	80mm						Good			Solar Eclipse
7944'	"						"			" "
7945	"						"			" "
7946	"						"			" "
7947	"						"			" "

LEC 12969

MAGAZINE V

(Frames AS12-47-6869 thru 7021)

The first 16 frames of this color magazine are high obliques of the lunar surface taken from the LM while in Lunar orbit. Target of opportunity Number 9 is included.

The remainder of this magazine illustrates the LM, deployed equipment, and the lunar surface around the landing area. Surface photography was exposed with the 60mm lens. Included are the following four panoramas taken near the landing area:

I. 47-6941 thru 6960

22 frame pan from NW at ALSEP to N at Flag, then to east with LM (Sunglint), and Surveyor Crater. Then to S and SW including Bench Crater.

II. 47-6961 thru 6981

22 frame pan NW from LM, E to Surveyor Crater and 360° pan back to LM.

III. 47-6982 thru 7006

25 frame pan, 360° taken from NE of LM looking W at panel and Flag, then to SW at LM and counterclockwise to S and W looking into Surveyor Crater. Then looking NW at TV and back to panel to complete 360° circuit.

IV. 47-7011 thru 7015

5 frame pan from NW to N showing from left to right blocky mound, ALSEP, Flag and Antenna.

APOLLO 12 PHOTOGRAPHY

Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6869	80				90	M	Fair	60-70	S	Craters 285, 28 7, Tsiolkovski
6870	80				90	M	Fair	60-70	S	"
6871	80				90	M	Fair	60-70	W	Crater II
6872	80				90	M	Fair	60-70	W	"
6873	80				90	M	Fair	60-70	W	"
6874	80				90	M	Fair	60-70	W	"
6875	80				100	L	Good	60-70	NE	Copernicus-Rheinhold
6876	80				100	L	Good	60-70	"	"
6877	80				100		Fair			CSM
6878	80				100		Fair			"
6879	80				90	M	Fair	70-80	W	T.O. 9, Crater II, Craters 276, 273
6880	80				90	M	Fair	70-80	W	"
6881	80				90	M	Fair	70-80	W	"
6882	80				90	M	Fair	70-80	W	"
6883	80				90	M	Fair	70-80	W	"

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APOLLO 12 PHOTOGRAPHY

Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6884	80				90	M	Fair	70-80	W	T.O. 9, Crater II, Craters 276, 273
6885	80				90	M	Fair	70-80	W	"
6886	80				90	M	Fair	70-80	W	"
6887	80				90	M	Fair	70-80	W	"
6888	80				90	M	Fair	70-80	W	"
6889	80				90	M	Fair	70-80	W	"
6890	80				90	M	Fair	70-80	W	"
6891	80				90	M	Fair	70-80	W	"
6892	80				90	M	Fair	70-80	W	"
6893	80				90	M	Fair	70-80	W	"
6894	80				90	M	Fair	70-80	W	"
6895	80				90	M	Fair	70-80	W	"
6896	60					Low	Good	Med. Obl.	W	Flag on Lunar Surface
6897	60					Low	Fair	Med. Obl.	W	" " " "
6898	60					Low	Fair	Med. Obl.	W	Solar Wind Panel

APOLLO 12 PHOTOGRAPHY

Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6899	60					Low	Fair	Med. Obl.	W	LM
6900	60					Low	Fair	Low Obl.	E	LM Footpad
6901	60					Low	Fair	Low Obl.	E	" "
6902	60					Low	Poor	Low Obl.	E	" "
6903	60					Low	Poor	Low Obl.	E	" "
6904	60					Low	Fair	Low Obl.	W	" "
6905	60					Low	Fair	Low Obl.	W	" "
6906	60					Low	Fair	Low Obl.	W	" "
6907	60					Low	Fair	Low Obl.	W	Engine Skirt
6908	60					Low	Fair	Low Obl.	W	LM Footpad
6909	60					Low	Fair	Low Obl.	W	" "
6910	60					Low	Fair	Low Obl.	W	Lower LM Structure
6911	60					Low	Good	Low Obl.	W	Lower LM Structure
6912	60					Low	Poor	Med. Obl.	W	Astronaut & LEC
6913	60					Low	Poor	Med. Obl.	W	" "

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6914	60					Low	Poor	Med. Obl.	W	Astronaut & LEC
6915	60					Low	Poor	Low Obl.	E	LM Footpad
6916	60					Low	Fair	Low Obl.	W	ALSEP Deployment
6917	60					Low	Fair	Low Obl.	W	" "
6918	60					Low	Fair	Med. Obl.	W	" "
6919	60					Low	Fair	Med. Obl.	W	" "
6920	60					Low	Fair	Low Obl.	W	" "
6921	60					Low	Fair	Med. Obl.	W	" "
6922	60					Low	Fair	Low Obl.	W	" "
6923	60					Low	Fair	Low Obl.	W	" "
6924	60					Low	Fair	Low Obl.	W	" "
6925	60					Low	Fair	Low Obl.	W	" "
6926	60					Low	Fair	Low Obl.	W	" "
6927	60					Low	Fair	Low Obl.	W	" "
6928	60					Low	Fair	Med. Obl.	E	" "

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Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
6929	60					Low	Good	Med. Obl.	W	ALSEP Deployment
6930	60					Low	Fair	Med. Obl.	W	" "
6931	60					Low	Fair	Med. Obl.	W	" "
6932	60					Low	Fair	Low Obl.	W	Lunar Surface
6933	60					Low	Fair	Low Obl.	W	" "
6934	60					Low	Fair	Low Obl.	W	" "
6935	60					Low	Fair	Low Obl.	W	" "
6936	60					Low	Fair	Low Obl.	W	" "
6937	60					Low	Fair	Low Obl.	W	" "
6938	60					Low	Fair	Low Obl.	W	" "
6939	60					Low	Fair	Low Obl.	W	" "
6940	60					Low	Fair	Low Obl.	W	" "
6941	60					Low	Fair	Med. Obl.	W	Start 20 Frame Pan Near LM
6942	60					Low	Fair	Med. Obl.	W	Start 20 Frame Pan Near LM
6943	60					Low	Fair	Med. Obl.		20 Frame Pan Near LM

APOLLO 12 PHOTOGRAPHY

Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6944	60					Low	Fair	Med. Obl.		20 Frame Pan Near LM
6945	60					Low	Fair	Med. Obl.		"
6946	60					Low	Fair	Med. Obl.		"
6947	60					Low	Fair	Med. Obl.		"
6948	60					Low	Fair	Med. Obl.		"
6949	60					Low	Poor	Med. Obl.		"
6950	60					Low	Poor	Med. Obl.		"
6951	60					Low	Poor	Med. Obl.		"
6952	60					Low	Poor	Med. Obl.		"
6953	60					Low	Poor	Med. Obl.		"
6954	60					Low	Fair	Med. Obl.		"
6955	60					Low	Fair	Med. Obl.		"
6956	60					Low	Fair	Med. Obl.		"
6957	60					Low	Fair	Med. Obl.		"
6958	60					Low	Fair	Med. Obl.		"

APOLLO 12 PHOTOGRAPHY

Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6959	60					Low	Fair	Med. Obl.		20 Frame Pan Near LM
6960	60					Low	Fair	Med. Obl.		End of 20 Frame Pan Near LM
6961	60					Low	Fair	Med. Obl.		21 Frame Pan Near LM
6962	60					Low	Fair	Med. Obl.		"
6963	60					Low	Fair	Med. Obl.		"
6964	60					Low	Fair	Med. Obl.		"
6965	60					Low	Fair	Med. Obl.		"
6966	60					Low	Fair	Med. Obl.		"
6967	60					Low	Fair	Med. Obl.		"
6968	60					Low	Fair	Med. Obl.		"
6969	60					Low	Poor	Med. Obl.		"
6970	60					Low	Poor	Med. Obl.		"
6971	60					Low	Poor	Med. Obl.		"
6972	60					Low	Poor	Med. Obl.		"
6973	60					Low	Poor	Med. Obl.		"

APOLLO 12 PHOTOGRAPHY

Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6974	60					Low	Poor	Med. Obl		21 Frame Pan Near LM
6975	60					Low	Poor	Med. Obl		21 Frame Pan Near LM
6976	60					Low	Fair	Med. Obl		"
6977	60					Low	Fair	Med. Obl		"
6978	60					Low	Fair	Med. Obl		"
6979	60					Low	Fair	Med. Obl		"
6980	60					Low	Fair	Med. Obl		"
6981	60					Low	Fair	Med. Obl		End of 21 Frame Pan Near LM
6982	60					Low	Fair	Med. Obl		Start of 25 Frame Pan Near LM
6983	60					Low	Fair	Med. Obl		25 Frame Pan Near LM
6984	60					Low	Fair	Med. Obl		"
6985	60					Low	Fair	Med. Obl		"
6986	60					Low	Fair	Med. Obl		"
6987	60					Low	Fair	Med. Obl		"
6988	60					Low	Fair	Med. Obl		"

APOLLO 12 PHOTOGRAPHY

Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6989	60					Low	Fair	Med. Obl.		25 Frame Pan Near LM
6990	60					Low	Fair	Med. Obl.		"
6991	60					Low	Fair	Med. Obl.		"
6992	60					Low	Fair	Med. Obl.		"
6993	60					Low	Fair	Med. Obl.		"
6994	60					Low	Poor	Med. Obl.		"
6995	60					Low	Poor	Med. Obl.		"
6996	60					Low	Poor	Med. Obl.		"
6997	60					Low	Poor	Med. Obl.		"
6998	60					Low	Poor	Med. Obl.		"
6999	60					Low	Poor	Med. Obl.		"
7000	60					Low	Fair	Med. Obl.		"
7001	60					Low	Fair	Med. Obl.		"
7002	60					Low	Fair	Med. Obl.		"
7003	60					Low	Fair	Med. Obl.		"

APOLLO 12 PHOTOGRAPHY

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7004	60					Low	Fair	Med. Obl.		25 Frame Pan Near LM
7005	60					Low	Fair	Med. Obl.		"
7006	60					Low	Fair	Med. Obl.		End of 25 Frame Pan Near LM
7007	60					Low	Good	Low Obl.	E	Core Tool
7008	60					Low	Good	Low Obl.		"
7009	60					Low	Poor	Low Obl.		Astronaut
7010	60					Low	Poor	Low Obl.		"
7011	60					Low	Fair	Med. Obl.		Start 5 Frame Pan Near LM
7012	60					Low	Fair	Med. Obl.		5 Frame Pan Near LM
7013	60					Low	Fair	Med. Obl.		"
7014	60					Low	Fair	Med. Obl.		"
7015	60					Low	Poor	Med. Obl.		End of 5 Frame Pan Near LM
7016	60					Low	Poor	Med. Obl.		LM Thruster & Antenna
7017	60					Low	Poor	Med. Obl.		"
7018	60					Low	Fair	Med. Obl.		"

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Magazine V Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7019	60					Low	Fair	Med. Obl.		Antenna & Flag
7020	60					Low	Fair	Med. Obl.	W	Lunar Surface

LEC 12969

MAGAZINE X
(Frames AS12-48-7022 thru 7171)

Magazine X is 70mm black and white photography taken before, during and after the second EVA on the Lunar Surface. Each of the images has a reseau superimposed on the 60mm lens.

Included in the picture content of this magazine are panoramic views of the Lunar Surface from the LM window showing the Flag and ALSEP equipment and the Solar Wind Panel. Surveyor III, Surveyor Crater, Block Crater, and the color chart are also included.

The following panoramas of areas on the Lunar Surface near the LM and Surveyor are listed below:

I. 48-7031-7032

2 frame view from LM looking Northwest at terrain near LM.

II. 48-7088-7090

3 frame pan of Surveyor Crater, view to Northwest from Southeastern rim, showing Surveyor, LM and blocky rim of small crater on north slopes of Surveyor Crater.

III. 48-7101-7105

5 frame pan to Northeast, inside Surveyor Crater, closeup view of Surveyor with arm extended.

IV. 48-7141-7143

3 frame pan of Block Crater, with view to West from East rim, showing LM and Surveyor Crater. Part of the Surveyor III is visible at the extreme upper left of the pan.

V. 48-7144-7147

4 frame pan of Block Crater with view to the South from the North rim showing view into Surveyor Crater. Surveyor III is visible in the upper left of the pan.

VI. 48-7153,7156,7157

These 3 frames comprise a short pan of the near terrain to the West of LM.

VII. 48-7166-7169

3 frame pan from LM looking North at ALSEP and Flag.

S/

VIII. 49-7308---7311

4 frame pan looking west showing the lunar surface, the lunar surface hand tool kit and Astronaut Bean with hand tools.

IX. 49-7321---7324

Originally a 5 frame pan of Surveyor Crater, Frame 7325 is 90% washout and 7326 will not tie end of pan. This pan, which contains 3 frames, begins on the southwestern rim of Surveyor Crater looking east at Surveyor and the eastern inner slope of the crater and pans counterclockwise to LM on the northwestern rim.

APOLLO 12 PHOTOGRAPHY

Magazine X Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7022						Low	Fair	OBLIQUE Med.	SW	Surface View from LM
7023						"	"	"	W	"
7024						"	Good	"	W	"
7025						"	"	"	"	"
7026						"	"	"	"	"
7027						"	"	"	"	"
7028						"	"	"	NW	"
7029						"	"	"	"	"
7030						"	"	"	"	"
7031						"	"	"	"	"
7032						"	"	"	"	"
7033						"	"	~~Low~~	"	"
7034						"	"	"	NE	View of MESA and Fuel Cask
7035						"	"	"	"	View Under LM
7036						"	"	"	W	Photograph of Color Chart

APOLLO 12 PHOTOGRAPHY

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7037						Low	Good	OBLIQUE Med.	W	Color Chart, Solar Wind Panel
7038						"	Fair	Low	E	Color Chart
7039						"	"	"	E	" "
7040						"	"	Med	E	" "
7041						"	Good	"	NW	Solar Wind Experiment
7042						"	"	"	SW	"
7043						"	"	Low	WSW	Small Crater on Lunar Surface
7044						"	"	"	W	"
7045						"	"	Med	"	"
7046						"	"	"	SW	View of Lunar Terrain
7047						"	"	"	"	"
7048						"	"	Low	SSW	Tri-Pod Holder of Core Tube Sampler
7049						"	"	"	"	"
7050						"	"	Med	W	"
7051						"	"	Low	SW	"

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7052						Low	Good	OBLIQUE Low	SW	Area of Core Sample
7053						"	"	"	"	"
7054						"	"	"	W	View of Lunar Terrain
7055						"	"	"	"	"
7056						"	"	Med	W	Crater on Lunar Surface
7057						"	"	"	"	"
7058						"	"	"	"	"
7059						"	"	Low	SW	Tri-Pod Holder for Core Tube, Lunar Terrain
7060						"	"	Med	W	Tri-Pod Holder for Core Tube, Large rock
7061						"	"	"	W	Tri-Pod Holder for Core Tube, Large Rock
7062						"	"	Low	SE	Core Sample
7063						"	"	Med	W	Tri-Pod Holder for Core Tube, Lunar Terrain
7064						"	"	"	"	"
7065						"	"	"	"	" Bench Crater
7066						"	"	"	"	" " "

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7067						Low	Good	OBLIQUE Med	W	Tri-Pod Holder for Core Tube, Bench Crater
7068						"	"	"	"	Tri-Pod Holder for Core Tube, Core Sample
7069						"	"	"	"	"
7070						"	"	Low	SW	Tri-Pod Holder for Core Tube, Lunar Terrain
7071						"	"	Med	NW	Astronaut Holding Core Tube, LM in Background
7072						"	"	"	SW	Tri-Pod Holder for Core Tube, Lunar Terrain
7073						"	"	"	"	"
7074						"	"	"	"	Tri-Pod Holder for Core Tube, Astronaut
7075						"	"	"	S	Lunar Terrain
7076						"	"	"	"	"
7077						"	"	"	SW	Lunar Terrain, Core Tube
7078						"	Poor	"	SW	Core Tube
7079						"	"			Washed Out
7080						"	"			"
7081						"	"			"

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Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7082						Low	Good	OBLIQUE Low	W	Tri-Pod Holder for Core Tube, Hand Tool Kit
7083						"	"	"	SW	"
7084						"	"	High	NE	Surveyor Crater Surveyor III
7085						"	"	"	"	"
7086						"	"	"	"	"
7087						"	"	"	"	"
7088						"	"	"	N	"
7089						"	"	"	"	"
7090						"	"	"	"	Surveyor Crater Surveyor III, LM
7091						"	"	"	NW	"
7092						"	"	"	NW	"
7093						"	"	"	NW	"
7094						"	"	Med	"	"
7095						"	"	"	"	Surveyor III
7096						"	"	"	"	"

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7097						Low	Good	OBLIQUE Med	NW	Surveyor Crater
7098						"	"	Low	E	Lunar Soil Near Surveyor Scoop
7099						"	"	High	NW	Surveyor III, LM
7100						"	"	"	"	"
7101						"	"	"	NE	Surveyor Crater
7102						Low	"	"	NE	Surveyor III, Scoop Shovel, Surveyor III
7103						"	"	"	"	"
7104						"	"	Med	NE	Surveyor III
7105						"	"	"	"	"
7106						"	"	"	"	Surveyor III Scoop Shovel
7107						"	"	"	"	"
7108						"	"	"	"	"
7109						"	"	"	"	"
7110						"	"	Low	N	Surveyor III, Foot Pad, with Pad Imprint
7111						"	"	"	"	"

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Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7112						Low	Good	OBLIQUE Low	N	Surveyor III Foot Pad, Pad Imprint
7113						"	"	"	"	Surveyor III Foot Pad
7114						"	"	"	"	Surveyor III
7115						"	"	Med	NW	"
7116						"	"	"	"	"
7117						"	"	"	"	"
7118						"	"	Low	NE	Surveyor III Equipment
7119						"	"	"	NW	Surveyor III Foot Pad
7120						"	"	"	"	"
7121						"	"	Med	NE	Surveyor III
7122						"	"	High	N	"
7123						"	"	"	NE	"
7124						"	"	Low	E	Surveyor III Foot Pad
7125						"	"	Med	SE	Surveyor III Equipment
7126						"	"	Low	SE	Surveyor III Foot Pad

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Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7127						Low	Good	OBLIQUE Low	S	Surveyor III Foot Pad
7128						"	"	"	S	Surveyor III Scoop Shovel
7129						"	"	"	SW	"
7130						"	"	High	W	Surveyor III Equipment
7131						"	"	"	"	"
7132						"	"	"	SW	"
7133						"	"	"	NW	View of Astronaut, Surveyor III and LM
7134						"	"	High	NW	"
7135						"	"	"	"	"
7136						"	"	"	"	"
7137						"	"	Med	SW	Surveyor III Equipment
7138						"	"	"	S	"
7139						"	"	"	NW	Surveyor Crater Terrain
7140						"	"	"	S	"
7141						"	"	"	SW	View of Block Crater, Surveyor Crater

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7142						Low	Good	OBLIQUE Med	SW	View of Block Crater Surveyor Crater
7143						"	"	"	W	View of Block Crater Surveyor Crater, LM
7144						"	"	"	S	Block Crater Surveyor III
7145						"	"	"	"	"
7146						"	"	"	SW	Block Crater Surveyor Crater
7147						"	"	"	"	Surveyor Crater
7148						"	"	Low	N	Astronaut using tongs to pick up rock
7149						"	"	"	"	"
7150						"	"	"	"	"
7151						"	"	High	W	View of LM
7152						"	"	"	"	"
7153						"	"	"	"	View of Lunar Terrain from LM
7154						"	"	"	SW	"
7155						"	"	"	W	"
7156						"	"	"	"	"

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
7157						Low	Good	OBLIQUE High	W	View of Lunar Terrain from LM
7158						"	"	Med	"	"
7159						"	"	High	NW	View from LM of ALSEP, Lunar Terrain
7160						"	"	Med	"	Flag, Footprints on Lunar Surface from LM
7161						"	"	"	"	Footprints on Lunar Surface from LM
7162						"	"	"	N	Flag, Footprints, Lunar Terrain from LM
7163						"	"	"	N	"
7164						"	"	High	NW	"
7165						"	"	"	"	View of Lunar Terrain from LM
7166						"	"	"	N	"
7167						"	"	"	"	Flag, ALSEP, Lunar Terrain from LM
7168						"	"	"	NW	ALSEP, Lunar Terrain from LM
7169						"	"	"	"	"
7170						"	"	"	"	"
7171						"	Fair	"	"	"

MAGAZINE Y

(Frames AS12-46-6715 thru 6868)

Magazine Y contains color photography taken before, during and after EVA 1. Each of the images has a reseau superimposed on the 60mm lens.

Included are the following seven panoramas of the area around the ALSEP deployment:

I. 46-6730-6745

17 frame pan from West to Northwest showing Astronaut before ALSEP deployment to Northeast at flag, antenna and LM (sunglint), to West with Surveyor Crater.

II. 46-6746-6763

19 frame pan, 360° taken from North of LM, includes Surveyor Crater, Surveyor, LM, flag, panel and TV camera and return back to Surveyor Crater.

III. 46-6764-6782

Complete 360° pan with Astronaut (camera station) Southeast of LM on rim of Surveyor Crater. Pan includes Surveyor III, Surveyor Crater and LM.

IV. 46-6807-6811

5 frame pan from South to Southwest showing Astronaut deploying ALSEP. LM, flag and antenna in background to South. Mound to Southwest in central portion of pan.

V. 46-6836-6844

9 frame pan of "1000 Crater" Northwest of Head Crater, showing entire rim with numerous rocks.

VI. 46-6845-6852

8 frame pan of "1000' Crater", Northwest of Head Crater, showing entire rim with numerous rocks.

VII. 46-6853-6855

3 frame pan to West, contains bench crater to extreme Southwest, head crater to West and blocky mound to Northwest.

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6715	60					Low	Poor	Med. Obl.	W	Astronaut on Ladder
6716	"					"	"	"	"	" " "
6717	"					"	"	"	"	" " "
6718	"					"	"	"	"	" " "
6719	"					"	Fair	Low Obl.	"	Footprints
6720	"					"	"	"	"	Lunar Surface
6721	"					"	"	"	"	" "
6722	"					"	"	"	"	" "
6723	"					"	"	"	"	" "
6724	"					"	Poor	Med. Obl.	"	Egress from LM
6725	"					"	Fair	"	"	" " "
6726	"					"	"	"	"	" " "
6727	"					"	"	"	"	" " "
6728	"					"	"	"	"	" " "
6729	"					"	"	"	"	" " "

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APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6730	60					Low	Fair	Med Obl.	W	Start 15 frame Pan near LM
6731	"					"	"	"	"	"
6732	"					"	"	"	"	"
6733	"					"	"	"	"	"
6734	"					"	"	"	"	"
6735	"					"	"	"		"
6736	"					"	"	"		"
6737	"					"	"	"	"	"
6738	"					"	Poor	"	"	"
6739	"					"	"	"	"	"
6740	"					"	"	"	"	"
6741	"					"	Fair	"	"	"
6742	"					"	"	"		"
6743	"					"	"	"		"
6744	"					"	"	"		"

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6745	60					Low	Fair	Med. Obl.		15Frame Pan near LM (end)
6746	"					"	"	"		17 Frame Pan near LM
6747	"					"	"	"		"
6748	"					"	"	"		"
6749	"					"	"	"		"
6750	"					"	"	"		"
6751	"					"	"	"		"
6752	"					"	"	"		"
6753	"					"	"	"		"
6754	"					"	"	"		"
6755	"					"	"	"		"
6756	"					"	"	"		"
6757	"					"	"	"		"
6758	"					"	"	"		"
6759	"					"	"	"		"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
6760	60					Low	Fair	Med. Obl.		(End) 17 Frame Pan Near LM
6761	"					"	Poor	"		"
6762	"					"	"	"		"
6763	"					"	"	"		"
6764	"					"	"	"		(Start 18 Frame Pan Near LM
6765	"					"	"	"		"
6766	"					"	"	"		"
6767	"					"	"	"		"
6768	"					"	"	"		"
6769	"					"	Fair	"		"
6770	"					"	"	"		"
6771	"					"	"	"		"
6772	"					"	"	"		"
6773	"					"	"	"		"
6774	"					"	"	"		"

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Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6775	60					Low	Fair	Med. Obl		~~18 Frame Pan Near LM~~
6776	"					"	"	"		"
6777	"					"	"	"		"
6778	"					"	"	"		"
6779	"					"	"	"		"
6780	"					"	"	"		"
6781	"					"	"	"		"
6782	"					"	Poor	"		" (End)
6783	"					"	Fair	"	W	ALSEP removal from LM
6784	"					"	"	"	"	"
6785	"					"	"	"	"	"
6786	"					"	"	"	"	"
6787	"					"	"	"	"	"
6788	"					"	"	"	"	"
6789	"					"	"	"	"	"

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Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6790	60					Low	Fair	Med. Obl.	W	ALSEP Removal from LM
6791	"					"	"	"	"	"
6792	"					"	"	"	N	"
6793	"					"	Poor	"	W	Lunar Surface Mound
6794	"					"	Fair	"	"	"
6795	"					"	"	"	"	"
6796	"					"	"	"		(Start) 8 Frame Pan WEST OF LM
6797	"					"	"	"		"
6798	"					"	"	"		"
6799	"					"	"	"		"
6800	"					"	"	"		"
6801	"					"	"	"		"
6802	"					"	"	"		"
6803	"					"	"	"		" (End)
6804	"					"	Poor	"		(Start) 8 Frame Pan ALSEP Package

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
6805	60					Low	Poor	Med. Obl.		8 Frame Pan ALSEP Package
6806	"					"	"	"		"
6807	"					"	Fair	"		"
6808	"					"	"	"		"
6809	"					"	"	"		"
6810	"					"	"	"		"
6811	"					"	"	"		" (End)
6812	"					"	"	Low Obl.	W	Solar Wind Exp.
6813	"					"	"	Med. Obl	"	ALSEP Cable
6814	"					"	"	"	"	Central Station
6815	"					"	"	"	"	"
6816	"					"	"	"	"	"
6817	"					"	"	"	"	"
6818	"					"	"	"	"	ALSEP Deployment
6819	"					"	Poor	"	E	"

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Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
6820	60					Low	Fair	Med Obl	W	Ion Detector
6821	"					"	"	"	"	ALSEP Deployment
6822	"					"	"	"	"	Mound
6823	"					"	"	"	"	"
6824	"					"	"	Low Obl	"	" 4x5 color Neg.
6825	"					"	"	"	"	"
6826	"					"	"	"	"	ALSEP Deployment
6827	"					"	"	"		Mound
6828	"					"	"	"		"
6829	"					"	"	"		"
6830	"					"	"	"		"
6831	"					"	"	"		"
6832	"					"	"	"		"
6833	"					"	"	"		Lunar Surface
6834	"					"	"	"		"

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
6835	60					Low	Fair	Low Obl.		Lunar Surface
6836	"					"	"	Med. Obl.	W	(Start) 9 Frame Pan NW of ALSEP
6837	"					"	"	"	"	"
6838	"					"	"	"	"	"
6839	"					"	"	"	"	"
6840	"					"	"	"	"	"
6841	"					"	"	"	"	"
6842	"					"	"	"	"	"
6843	"					"	"	"	"	"
6844	"					"	"	"	"	" (End)
6845	"					"	"	"		(Start) 8 Frame Pan NW of ALSEP
6846	"					"	"	"		"
6847	"					"	"	"		"
6848	"					"	"	"	"	
6849	"					"	"	"		"

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APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
6850	60					Low	Fair	Med. Obl.		8 Frame Pan NW of ALSEP
6851	"					"	"	"		"
6852	"					"	"	"		"
6853	"					"	"	Low Obl.	W	(Start) 3 Frame Pan From LM
6854	"					"	"	"	"	"
6855	"					"	"	"	"	" (End)
6856	"					"	"	"	"	(Start 4 Frame Pan From LM
6857	"					"	"	"	"	"
6858	"					"	"	"	"	"
6859	"					"	"	"	"	" (End)
6860	"					"	"	Med. Obl.	"	ALSEP From LM
6861	"					"	"	"	"	Solar Wind Panel Flag/Antenna
6862	"					"	"	"	"	3 Frame Pan ALSEP From LM (Start)
6863	"					"	"	"	"	"
6864	"					"	"	"	"	" (End)

APOLLO 12 PHOTOGRAPHY

Magazine Y Film HCEX

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
6865	60					Low	Fair	Med. Obl.	W	Flag/Antenna/Solar Wind
6866	"					"	"	"	"	ALSEP From LM
6867	"					"	"	"	"	"
6868	"					"	"	"	"	"

LEC 12969

MAGAZINE Z

(Frames AS 12-49-7172 thru Frames 7324)

Magazine Z is 70mm black and white photography taken on the Lunar Surface during the second EVA. A 60mm lens with a reseau was used. Photo content includes the core samples, took kit and views of Head, Bench and Halo Craters.

The following descriptions are of the Magazine Z Panorama:

I. 49-7209---7212

4 frame pan looking west to north showing the Lunar Surface. Lunar Surface hand tool kit is in the center of the pan.

II. 49-7213---7215

3 frame pan to east over head crater, showing LM.

III. 49-7223---7328

6 frame clockwise pan of bench crater, rim to rim, looking south from north rim, showing E, S, W inner walls and large rocks in floor.

IV. 49-7229---7233

5 frame counterclockwise pan of bench crater from north rim, showing south and west walls and floor.

V. 49-7244---7256

13 frame counterclockwise pan looking east into sun, showing astronaut, LM and numerous rocks. Pan continues to the north and then to due west.

VI. 49-7263---7269

5 frame counterclockwise pan of sharp crater looking west from outside eastern rim. Very blocky.

VII. 49-7271---7275

5 frame clockwise pan of sharp crater looking from east rim to west.

APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
7172						Low	Poor	---	S	Lunar Terrain
7173						"	Good	High	"	View into Head Crater
7174						"	"	"	"	" "
7175						"	"	"	"	" "
7176						"	"	"	"	" "
7177						"	"	"	"	" "
7178						"	"	"	"	" "
7179						"	"	Med.	"	" "
7180						"	"	"	"	" "
7181						"	"	"	"	" "
7182						"	"	"	"	" "
7183						"	"	"	"	" "
7184						"	"	"	SE	" "
7185						"	"	"	"	" "
7186						"	"	"	"	" "

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APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
7187						Low	Good	Med.	SE	View into Head Crater
7188						"	"	"	"	" "
7189						"	"	Low	N	Tri-Pod Holder for Core Sampler
7190						"	"	"	NW	Core Sampler Lunar Surface
7191						"	"	"	"	" "
7192						"	"	"	"	" "
7193						"	"	"	N	" "
7194						"	"	"	NW	" "
7195						"	"	"	N	" "
7196						"	"	"	N	" "
7197						"	"	"	SE	" "
7198						"	"	"	E	" "
7199						"	"	"	SE	" "
7200						"	"	Med.	SE	View of Lunar Surface
7201						"	"	High	SE	" "

APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
7202						Low	Good	High	SE	View of Lunar Surface
7203						"	"	"	S	" "
7204						"	"	"	SW	" "
7205						"	"	"	SW	" "
7206						"	"	"	W	" "
7207						"	"	"	"	" "
7208						"	"	"	NW	" "
7209						"	"	"	"	" "
7210						"	"	Med.	NW	View of Lunar Surface Hand Tool Kit
7211						"	"	"	N	" "
7212						"	"	"	N	View of Lunar Surface
7213						"	"	"	NE	Astronaut LM, Head Crater
7214						"	Fair	Med.	E	LM, Head Crater
7215						"	"	"	E	" "
7216						"	"	"	E	Head Crater

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APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
			Lat	Long						
7217						Low	Good	Low	NW	Core Sampler
7218						"	"	"	"	" "
7219						"	"	"	N	Core Sampler Large Rock
7220						"	"	"	N	" "
7221						"	"	Med.	NNE	Core Sampler Hand Tool Kit
7222						"	"	"	"	" "
7223						"	"	"	SE	Bench Crater
7224						"	"	"	S	" "
7225						"	"	"	"	" "
7226						"	"	"	SW	" "
7227						"	"	"	"	" "
7228						"	"	"	"	" "
7229						"	"	"	W	" "
7230						"	"	"	SW	" "
7231						"	"	"	S	" "

APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
7232						Low	Good	Med.	S	Bench Crater
7233						"	"	"	SE	Bench Crater
7234						"	"	Low	"	Core Sampler Bench Crater
7235						"	"	"	"	" "
7236						Low	Good	Low	S	Core Sampler
7237						"	"	"	SE	Core Sampler Bench Crater
7238						"	"	"	"	" "
7239						"	"	"	E	" "
7240						"	"	Med.	S	" "
7241						"	"	"	"	" "
7242						"	"	Low	W	Core Sampler Hand Tool Kit
7243						"	"	"	"	" "
7244						"	"	High	E	View of Lunar Terrain
7245						"	Fair	"	"	View of Lunar Terrain, Astronaut
7246						"	"	"	"	Astronaut Carrying Hand Tool Kit, LM, Lunar Terrain

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APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point Lat	Principal Point Long	Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
7247						Low	Fair	High	NE	Lunar Terrain, LM
7248						"	Good	"	"	" "
7249						"	"	"	N	" "
7250						"	"	"	NE	Lunar Terrain
7251						"	"	"	N	" "
7252						"	"	"	NW	View of Lunar Terrain
7253						"	"	"	"	Large Boulder
7254						"	"	"	W	Lunar Terrain
7255						"	"	"	"	" "
7256						"	"	"	"	" "
7257						"	"	"	"	" "
7258						"	"	"	SW	" "
7259						"	"	"	S	" "
7260						"	"	Med.	S	Lunar Terrain Large Rock
7261						"	"	"	SE	Lunar Terrain

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
			Lat	Long						
7262						Low	Good	Med.	SE	Lunar Terrain
7263						"	"	"	NW	Halo Crater
7264						"	"	"	W	" "
7265						"	"	"	"	" "
7266						"	"	"	"	" "
7267						"	"	"	"	" "
7268						"	"	"	SW	Halo Crater
7269						"	"	"	"	" "
7270						"	"	"	"	" "
7271						"	"	"	W	" "
7272						"	"	"	"	" "
7273						"	"	"	"	" "
7274						"	"	"	NW	" "
7275						"	"	"	"	" "
7276						"	"	Low	S	Core Sampler Near Halo Crater

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
			Lat	Long						
7277						Low	Good	Low	S	Core Sampler near Halo Crater
7278						"	"	Med.	SE	Astronaut holding Core Sample
7279						"	"	Low	S	Core Sampler near Halo Crater
7280						"	"	"	"	" "
7281						"	"	Med.	S	Astronaut, Hand Tool Kit
7282						"	"	"	SE	Core Sampler
7283						"	"	Low	SE	" "
7284						"	"	"	"	" "
7285						"	"	"	"	" "
7286						"	"	Med.	SW	Astronaut and Core Sampler
7287						"	"	Low	S	Core Sampler
7288						"	"	"	SE	" "
7289						"	"	High	W	View of Lunar Terrain
7290						"	"	"	W	" "
7291						"	"	"	SW	" "

APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
			Lat	Long						
7292						Low	Good	High	S	View of Lunar Terrain
7293						"	"	"	"	" "
7294						"	"	"	SE	" "
7295						"	"	"	E	" "
7296						"	Fair	"	"	" "
7297						"	"	"	"	" "
7298						"	"	"	"	" "
7299						"	"	"	"	" "
7300						"	Good	High	NE	View of Lunar Terrain
7301						"	"	"	"	" "
7302						"	"	"	N	" "
7303						"	"	"	"	" "
7304						"	"	"	"	" "
7305						"	"	"	"	" "
7306						"	"	"	"	" "

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Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Oblique	Direction of Tilt	Description
			Lat	Long						
7307						Low	Good	Med.	NW	Astronaut and Hand Tool Kit
7308						"	"	"	"	" "
7309						"	"	High	W	" "
7310						"	Fair	"	W	View of Lunar Terrain
7311						"	Fair	"	W	" "
7312						"	Good	Low	SW	Astronaut Collecting Rock
7313						"	Good	"	NW	" "
7314						"	"	"	S	Core Sampler, Hand Tool Kit
7315						"	"	"	S	" "
7316						"	Good	High	NW	View of LM
7317						"	"	"	"	" "
7318						"	"	Med.	SE	Astronaut and Hand Tool Kit
7319						"	"	"	"	" "
7320						"	"	Low	"	" "
7321						"	Poor	High	E	View of Lunar Terrain, Surveyor III

APOLLO 12 PHOTOGRAPHY

Magazine Z Film SO-267

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Oblique Tilt	Direction of Tilt	Description
			Lat	Long						
7322						Low	Fair	High	NE	Surveyor Crater Surveyor III
7323						"	Poor	---	---	Photo Underexposed
7324						"	Fair	Med.	E	Surveyor Crater

LEC 12969

MAGAZINE EE

(Frames AS12-55-8121 Thru Frames 8297)

Photo coverage of magazine EE (AS12-55) is imaged on 70mm B&W (S0164) film. Exposures were made from the command module with camera focal lengths of 80mm and 250mm at approximately 60 nautical mile altitude. Frames start with number 8121 and end at 8297, a total of 177 exposures, of poor to good quality photography. The 75 frame 80mm stereo sequence of near vertical exposures of the back-side of the lunar surface are good. Approximate coverage is from 113°E 5°S to 34°E 11°S. TO 13 is covered on frames 8197 and 8198. Complete coverage of craters Kapteyn, Langrenus A and Magelhaens was obtained, La Perouse crater excepting the very northern section and the northern part of Langrenus crater were also photographed in this near vertical stereo sequence. Other coverage included 80mm lens high obliques of Reiner crater, TO53, frames 8121-8123, 250mm lens high altitude small scale TE1 photographs of the eastern part of the lunar surface, frames 8201-8297. In this series frames 8216-8225 showed good detail. Six exposures of MAG EE were blanks.

APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W (S0164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8196	80	1:1,376,900	11.0°S	41.0°E	65%	High	Fair	Near Vertical	W	S Edge of Gutenberg & N of Pyrenaeus
8197	"	"	"	40.0°E	"	"	"	"	"	SW of Gutenberg & Gaudibert J: TO 13
8198	"	"	"	39.0°E	"	"	"	"	W	E 3/4 of Gaudibert & SW of Gutenberg; TO 12
8199	"	"	"	38.0°E	"	"	"	"	"	Gaudibert & surrounding Area
8200	"	"	"	36.0°E	"	"	"	"	"	W 1/4 of Gaudibert & SE of Capella
8201	250						"			TEI East Half of Moon
8202	"						"			"
8203	"						"			"
8204	"						"			"
8205	"						"			"
8206	"						"			"
8207	"						"			"
8208	"						"			"
8209	"						"			"
8210	"						"			"

APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W (SO164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8209	250						Fair			TEI East Half of Moon
8210	"						"			"
8211	"						"			"
8212	"						"			"
8213	"						"			TEI E 3/4 of Moon
8214	"						"			"
8215	"						"			"
8216	"						"			"
8217	"						"			Nadir Near Mare Crisium
8218	"						"			"
8219	"						"			"
8220	"						"			"
8221	"						"			" B/W Neg
8222	"						"			"
8223	"						"			"

APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W (SO164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8224	250						Fair			Nadir Near Mare Crisium
8225	"						"			"
8226	"						"			"
8227	"						"			"
8228	"						Poor			Poor Detail
8229	"						"			"
8230	"						"			"
8231	"						"			"
8232	"						"			Dark TEI E 3/4 of Moon
8233	"						"			"
8234	"						"			"
8235	"						"			"
8236	"						"			"
8237	"						"			"
8238	"						"			"

APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W (SO164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8239	250						Poor			Dark TEI E 3/4 of Moon
8240	"						"			"
8241	"						"			"
8242	"						"			"
8243	"						"			"
8244	"						"			"
8245	"						"			"
8246	"						"			"
8247	"						"			"
8248	"						"			"
8249	"						"			"
8250	"						"			"
8251	"						"			"
8252	"						"			"
8253	"						"			"

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APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W (SO164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8254	250						Poor			Dark TEI E 3/4 of Moon
8255	"						"			"
8256	"						"			"
8257	"						"			"
8258	"						"			"
8259	"						"			"
8260	"						"			"
8261	"						"			"
8262	"						"			"
8263	"						"			"
8264	"						"			TEI - Very Distant Photos of Moon
8265	"						"			"
8266	"						"			"
8267	"						"			"
8268	"						"			"

APOLLO 12 PHOTOGRAPHY

Magazine EE Film B&W (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8269	250						Poor			TEI- Very distant photos of Moon
8270	"						"			"
8271	"									
8272	"						"			TEI - Very distant photos of Moon
8273	"									
8274	"						"			TEI - Very distant photos of Moon
8275	"						"			"
8276	"						"			"
8277	"						"			"
8278	"						"			"
8279	"						"			"
8280	"						"			"
8281	"						"			"
8282	"						"			"
8283	"						"			"

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APOLLO 12 PHOTOGRAPHY

Magazine ~~EE~~ Film ~~B&W~~ (SO 164)

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length mm	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8284	250						Poor			TEI - Very Distant Photos of Moon
8285	"						"			"
8286	"						"			"
8287	"						"			"
8288	"						"			"
8289	"						"			"
8290	"	Blank								Blank
8291	"	"								"
8292	"	"								"
8293	"	"								"
8294	"						Poor			Unidentified Object - Pos. Section of Hatch
8295	"						"			Window Rings
8296	"						"			Unidentified Object Pos. Section of Hatch
8297	"						"			Window Rings

APOLLO 12

LUNAR MULTISPECTRAL CAMERA

(LMC) S-158 Experiment Assembly

I. Characteristics - Four EL Hasselblad cameras with 80mm lenses were mounted together in such a manner that they could be aimed and operated simultaneously.

Magazine AA-- 80mm lens - Infrared B & W S0246, 87C filter, 114 frames

Magazine BB-- 80mm lens - medium speed B & W 3401, 47B filter, (blue) 150 frames

Magazine CC-- 80mm lens - medium speed B & W 3401, 29 + filter (red), 150 frames

Magazine DD-- 80mm lens - B & W 3400, 58 filter (green), 150 frames

Camera mounts were perpendicular to hatch window. Alignment was 57.5° pitched up from X axis. The B & W IR does not give as complete coverage as does the B & W, since this camera was turned on midway in the sequence.
See Multispectral Camera Photo Index for coverage.

APOLLO 12 PHOTOGRAPHY

Magazine AA Film IRBW

Time Reference — GET Filter Blk 87C

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8314	80mm	1:1,470,000	10.5°S	101.5°E	60%	Medium	Fair	Vertical	-----	Begin IR Stereo Strip
Thru	"									
8326	"	"	12.5°S	89.0°E	"	"	"	"		End IR Stereo Strip
8349	"	"	13.0°S	33.0°E	"	High	"	"		Begin IR Stereo Strip
Thru	"	"			"	"	"	"		Theophilus, Descartes Fra Mauro
8393	"	"	04.0°S	15.0°W	"	Low	Good	"		End IR Stereo Strip
8394	"	"	12.0°S	93.0°E	"	High	Fair	"		Begin IR Stereo Strip
Thru	"	"								Ansgarius, Kapteyn C Lame, McClure
8433	"	"	14.0°S	51.0°E	"	"	Poor	"		End IR Stereo Strip
8434	"	"	12.0°S	27.0°E	"	"	"	10°-20°	North	Theophilus
8435	"	"	"	"	"	"	"	"	"	"
8436	"	"	11.0°S	15.0°E	"	"	"	Vertical	-----	Descartes
8437	"	"	"	"	"	"	"	"		"
8438	"	"	04.0°S	15.0°W	"	Medium	Fair	"	-----	Fra Mauro
8439	"	"	"	"	"	"	"	"		Fra Mauro End Experiment

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APOLLO 12 PHOTOGRAPHY

Magazine BB, CC, DD Film 3401 MBW

Time Reference — GET _____ = GMT _____

Frame #	Camera # f Length	Approx. Photo Scale	Principal Point		Fwd O/L	Sun Angle	Photo Quality	Approx. Tilt Min — Max	Direction of Tilt	Description
			Lat	Long						
8298	80mm	1:1,500,000	04.0°S	133.0°E	None	Low	Good	Vertical	-----	Crater #286
8299	"	"	06.0°S	120.0°E	60%	"	"	"		Begin Stereo Strip Crater II
Thru	"	"				"	"	"		" "
8326	"	"	12.5°S	89.0°E	"	"	"	"	-----	End Stereo Strip
8327	"	"	14.0°S	54.0°E	"	High	Fair	"	-----	Begin Stereo Strip
Thru	"	"			"	"	"	"	-----	McClure, Theophilus
8393	"	"	04.0°S	15.0°W	"	Medium	Fair to Good	"	-----	Descartes, Lalande
8394	"	"	13.0°S	93.0°E	"	"	Good	"	-----	Begin Stereo Strip Ansgarius
Thru	"	"				"		"	-----	Kapteyn A and C
8433	"	"	14.0°S	51.0°E	"	"	Fair	"	-----	End Stereo Strip McClure
8434	"	"	12.0°S	27.0°E	"	High	Good	10°-20°	North	Theophilus
8435	"	"	"	"	"	"	"	"	"	"
8436	"	"	11.0°S	15.0°E	"	"	"	Vertical	-----	Descartes
8437	"	"	"	"	"	"	"	"	-----	"
8438 & 8439	"	"	04.0°S	15.0°W	"	"	"	"	-----	Fra Mauro End Experiment

MAGAZINES A thru P

Magazines A thru P are 16mm color and black and white sequence photography of the lunar surface taken from the CSM and the LM. There are a total of 15 magazines lettered A thru P with the letter J excluded. All magazines are color with the exception of magazine I. The quality of the photography ranges from poor to good.

Magazines A thru D, in order, portray Transposition and Docking; the LM in formation prior to landing; LM ascent from the CSM; and the LM being jettisoned. Magazine C also contains views of the Landing Site and the Surveyor III Site as seen through the sextant. Significant surface features covered on these four magazines are the Pyrenees Mountains, the Sea of Nectar, and the craters of Theophilus, Descartes, and Lalande A.

Magazine E is a sextant photography stereo strip running from east to west covering such features as Theophilus Peaks, Lalande A, and Fra Mauro. Also included are Landmark Tracking Sites (CP-1, CP-2, DE-1, and FM-1). The last section of Magazine E was taken after TEI and shows the eastern limb of the moon where Basin II, the farside terminator, and the Symth's and Crises Seas can be seen.

Magazines F thru I in order, include a sextant photography stereo strip, re-entry, the CSM interior, and black and white oblique sequences of Herschel, Fra Mauro, and Lalande.

Magazine K contains exposures of the CSM, Fra Mauro, Lalande, Ptolemaeus and the LM Descent and landing.

Magazine L, M, N and O were recorded from the LM after landing and include views of the deployed ALSEP, the American Flag, the S-BAND Antenna, and some of the astronaut activities during the first EVA.

Magazine P shows the Earth rise, Basin II, and the nearside terminator.

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: A FILM: 16mm

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-1600	-	Transposition and Docking	Good quality
1780-4180	14°S-75°E to 14°S-40°E	Craters Cocombo, Lane, Kapteyn B, Pyrenees Mountains	Good quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: B FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-3415	15°S-30°E to 8°S-14°W	LM in formation prior to landing	Good Quality
		Theophilus, Cyrillus, Cyrillus "B",	
		Kant, Descartes, Dollond, Andel,	
		Ritchey, Hind, Halley, Albategnius,	
		Klein, Muller, Ptolemaeus, Herschel	
		LaLande "A"	
3416-5316		LM in formation prior to landing	Good Quality
		(No Surface)	

LEC 12569

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: C FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-2258	6°S-120°E to 11°S-98°E	Basin II Area	Poor to Fair quality
2259=2373		Landing Site (Surveyor III Crater) Through Sextant	Fair Quality
2374-2554	00°-31°W	Sextant Photography of Lansberg "A"	Fair Quality
2555-5459	88 To 12°S-80°E	LM ascent from CSM. Sequence ends over Crater Ansgarius	** Beginning of sequence unplottable.

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: D FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-3630	13°S-77°E to 15°S-35°E	LM Docking with CSM. Craters	Good Quality
		Ansgarius, Kapteyn "B", Lame, Lohse	
		Crozier, Colombo, Magelhaens,	
		Madler, Theophilus, Sea of Nectar,	
		Pyrenees Mountains	
4726		LM Jettison	Good Quality

LEC 12569

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: E FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
0-616		Bright yellow dot against black background of space.	Poor film quality
617-1677	12S/41E to 4S/22W	Sextant photography stereo strip	Fair to Good quality.
			(From east to west,
			photos partially cover
			Daguerre, Theophilus,
			Kant, Dollond, Andel,
			Ptolemaeus, LaLande "A"
			& Fra Mauro).
(720)	11.7°S/33.3°E	Small bright crater in Daguerre	
(823)	11.5°S/26.3°E	Theophilus Peaks	
(917)	11.2°S/20.2°E	South rim of Kant	
(1015)	10.6°S/14.4°E	Dollond	
(1250)	8.9°S/1°E	Small wedge shaped crater on East rim of Ptolemaeus	
(1452)	6.5°S/10.3°W	West of LaLande "A"	
1678-1859	6°S/112°E	Sextant photography; landmark tracking site CP-1	Fair Quality
1860-2054	10°S/56°E	Sextant photography; landmark tracking site CP-2	Poor Quality Over-exposed
2055-2222	09°S/15.5°E	Sextant photography; landmark tracking site DE-1	Poor
	03°S/17°W	Sextant photography; landmark tracking site FM-1	Fair Quality

LEC 12569

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: E FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
2398-2669	06°S/112°E	Sextant photography; landmark tracking site CP-1	Fair Quality
2670-2924	10°S/56°E	Sextant photography; landmark tracking site CP-2	Fair Quality
2925-3115	09°S/15.5°E	Sextant photography; landmark tracking site DE-1	Poor--over-exposed
3116-3272	03°S/17°W	Sextant photography; landmark tracking site FM-1	Fair
3273	Centered near 0° Lat.	TEI, Eastern Limb of Moon;	Good Quality
	and 100°E Long.	including Basin II, Smyth's Sea Craters 201, 197, 198, 199, 195	
		192, 191, 189, 202, 204, 206, 207 275, 277, 273, 270, 276.	
3478-3643	Centered near 0° Lat.	TEI, Eastern limb of Moon	Good Quality
	and 90° East.	including farside terminator. Direction of view is south and	
		southwestward. Includes Sea of Crises, Smyth's Sea, Basin II	

LEC 12569

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: F FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-3386	3°S/123°E to 3°N/52°W	Sextant Photography Stereo Strip	Good Quality-High Sun Angle-Views are washed-out
(84)	4.5°S/120°E	Double Crater on ridge East on Crater 277	Located on Frame AS12-54-7953 (Mag. T)
(203)	6°S/112°E	Small Sharp Rim Crater East of Crater 273	Located on Frame AS12-54-7958 (Mag. T)
(237)	6°S/110.5°E	Small Crater on Southeast Rim of Crater 273	Located on Frame AS12-54-7960 (Mag. T)
(323)	7°S/106.5°E	Rim of Sharp Crater North of Basin II	Located on Frame AS12-54-2964 (Mag. T)
(395)	7.5°S/104°E	Rim of Crater Complex North of Basin II	Located on Frame AS12-54-7967 (Mag T)
(920)	10.5°S/76°E	Bright Crater in LaPerouse	Located on Frame AS12-54-7994 (Mag T)
(2308)	7°S/4.0°E	Small Bright Crater South of Hipparchus	Located on Frame AS12-54-8063 (Mag T)
(2336)	7°S/2.5°E	Old Crater and Small Bright Crater North of Müller	Located on Frame AS12-54-8065 (Mag T)
(2433)	6°S/3°N	West Rim of Herschel	Located on Frame AS12-54-8070 (Mag T)
(2494)	5.5°S/6°W	Double Crater East of LaLande "C"	Located on Frame AS12-54-8073 (Mag T)
(2588)	5°S/11°W	Small Crater West of LaLande	Located on Frame AS12-54-8078 (Mag T)
(2645)	4.5°S/13.5°W	Small Crater Northeast of Fra Mauro	Located on Frame AS12-54-8081 (Mag T)
(2663)	4°S/14.5°W	Small Crater Northeast of Fra Mauro	Located on Frame AS12-54-8081 (Mag T)
(2703)	4°S/16.5°S	Small Sharp Crater North of Fra Mauro	Located on Frame AS12-54-8083 (Mag T)

LEC 12569

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: F FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
(2746)	3.5°S/18.5°W	Juncture of Mare and Highlands North of Fra Mauro	Located on Frame AS12-54-8083 (Mag T)
(2758)	3°S/20.5°W	Mare Northwest of Fra Mauro	Located on Frame AS12-54-8086 (Mag T)
(2917)	1.5°S/ 27°W	Small Double Crater South of Lansburg	Located on Frame AS12-54-8093 (Mag T)
(2968)	1.5°S/ 29.5°W	Small Crater and Rille Northwest of Lansburg "G"	Located on Frame AS12-54-8096 (Mag T)
(3096)	.5°N/36°W	Small Crater and Rille Southeast of Encke "C"	Located on Frame AS12-54-8103 (Mag T)
(3144)	1°N/38.5°W	Small Triple Crater South Encke "T"	Located on Frame AS12-54-8105 (Mag T)
(3169)	1°N/40.5°W	Double Crater North of Encke "E"	Located on Frame AS12-58-8106 (Mag T)
3387-3856	-----	Solar Eclipse by Earth	Good Quality

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: G FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-5519		Re-entry, drag and main parachute deployment	Good Quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: H FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-1103	CSM Interior	Crew shaving, astronaut using Hasalblad 70mm Camera, Astronaut exercising, drinking.	Fair to Good Quality

APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: I FILM: B&W

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-2000	7°S-8°E to 6°S-3°W	Oblique Sequence to Herschel, includes craters Hind, Halley, Miller, North Portion of Ptolemaeus	Poor to Fair Quality
2001-3431		Too poor Quality to Plot	Poor Quality
3432-4911	5°S-11°W to 35°S-17°W	Oblique Sequence to Fra Mauro	Poor to Fair Quality
4912-6000	6°S-4°W to 4°S-9°W	Oblique Sequence to LaLande	Poor to Fair Quality
1-1164	7°S-0° to 5°S - 20°W	CSM from LM, Frau Mauro, Perry "L" & "C", LaLande, LaLande "A", "C", Herschel, Ptolemaeus	Poor Quality
1165-5494	2°S-26°W to 3°S-23°W	LM Descent and Landing	Good Quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: L FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-1557	Landing Site (3°S-23°W)	View out of LM window looking northwest. Astronaut during EVA	Good Quality
1558-3974	Landing Site (3°S-23°W)	Astronaut collecting lunar surface sample	Good Quality
3925-4109	Landing Site (3°S-23°W)	ALSEP Deployment Site	Fair Quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: M FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-3808	Landing Site (3°S-23°W)	View from landed LM (window) looking Northwest. Astronaut during EVA	Good Quality
3809-5466	Landing Site (3°S-23°W)	View from landed LM (window) looking northwest. Shows American Flag, deployed ALSEP, "S" BAND Antenna	Good Quality
5467-5576	Landing Site (3°S-23°W)	View from landed LM looking west. Shows LM Shadow	Good Quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: N FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-88	Landing Site(3°S-23°W)	View from landed LM (window).	Good Quality
		Astronaut during EVA.	
89-5539	Landing Site(3°S-23°W)	Panorama, Flag, ALSEP, LM shadow.	Poor-out of focus
		"S" BAND Antenna	

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: 0 FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-5518	LM Landing Site(3°S-23°W	Taken from LM window after landing Shows American Flag, "S" BAND Antenna; Direction of View North, Astronaut during EVA	Good Quality

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APOLLO 12 SEQUENCE PHOTOGRAPHY (16mm)

MAG: P FILM: Color

FRAME NUMBER	LOCATION	DESCRIPTION	REMARKS
1-332		Overexposed & Unusable	
333-781	2°S-25°W to 2°S-27°N	Lansberg "N"	Good Quality
782-1181	10°S-105°E to 11°S-	Earthrise, Basin II	Poor Quality
	100°E		Dirty Window Out-of-Focus
1182-2694	3°N-40°W to 3°N-43°W	Terminator, Maestlin "R"	Fair Quality
2695-3157		Blurry CSM from LM	Poor Quality
3158-3456		Too poor quality to plot	

APOLLO 12 PHOTOGRAPHIC COVERAGE PLOTS

Photographic ground track plots which show the actual photographic coverage of the Lunar Terrain are being finalized by Aeronautical Chart and Information Center, St. Louis, Missouri.

APOLLO 12 EVA 70mm PANORAMA MOSAICS

Apollo 12 EVA Mosaics are being submitted to NASA Reproduction for copy and reduction to desirable format.